BLACK HILLS MINERAL ATLAS, SOUTH DAKOTA: PART 2

(IN TWO PARTS)

BY BUREAU OF MINES STAFF, REGION V

* * * * * * * * * **Information Circular 7707**

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UNITED STATES DEPARTMENT OF THE INTERIOR
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Bureau of Mines Staff, Region V[1]

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[1] Mining Division, Rapid City Field Office.

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INTRODUCTION

The Black Hills Mineral Atlas briefly summarizes all important data available on the mines and mineral deposits in the Black Hills that have been explored, developed, mined, or located.

The purpose of the atlas is threefold: First, from available data the general potentialities of the Black Hills region can be determined, although it is not possible to calculate actual ore reserves; second, it will provide the necessary basic information regarding a given property or commodity for further detailed study; and third, the compilation is a comprehensive directory of Black Hills deposits.

The atlas, admittedly, is not complete, as much information regarding early operations is extremely meager or missing entirely. Data on more recent operations are sometimes equally difficult to obtain. It is planned to review the atlas at periodic intervals to add information not available at present and to make descriptions of operating properties current. Interested persons having authentic data are invited to supply it to the Bureau of Mines in case of error in this tabulation or for additional information.

For convenience in compiling and reporting the data, the Black Hills region was divided into four areas. Areas C and D are discussed in this report (Information Circular 7707). Areas A and B have been discussed in Information Circular 7688, which is Part 1.

ACKNOWLEDGMENTS

The compilation of the atlas is the combined work of several of the staff of the Mining Division at Rapid City over a period of 3 to 4 years.

LOCATION AND PHYSICAL FEATURES

The Black Hills are situated in the western part of South Dakota, principally in Lawrence, Pennington, and Custer Counties, and extend into Crook and Weston Counties, Wyo. They cover an area approximately 100 miles long and 50 miles wide at the greatest dimensions.

The Black Hills have been carved from a dome-shaped uplift. It is characterized by a hogback ridge that forms an outer rim; the Red Valley, a depression that extends entirely around the uplift; a limestone plateau with an infacing escarpment; and a central area of high ridges and tortuous valleys that culminate in Harney Peak at an altitude of 7,242 feet. Harney Peak is the highest elevation between the Mississippi River and the Rocky Mountains. Figure 1 shows the location of the Black Hills area.

Because of the rugged nature of the Black Hills, they are the source of many streams that have cut through the hogback and drain to the Belle Fourche River on the north and the Cheyenne River on the south and east. Both rivers are tributaries of the Missouri River. Areas outside the Black Hills are semiarid grazing lands with annual rainfall averaging 12 to 16 inches. Rainfall at Spearfish in the northern part of the Black Hills averages about 21 inches a year.

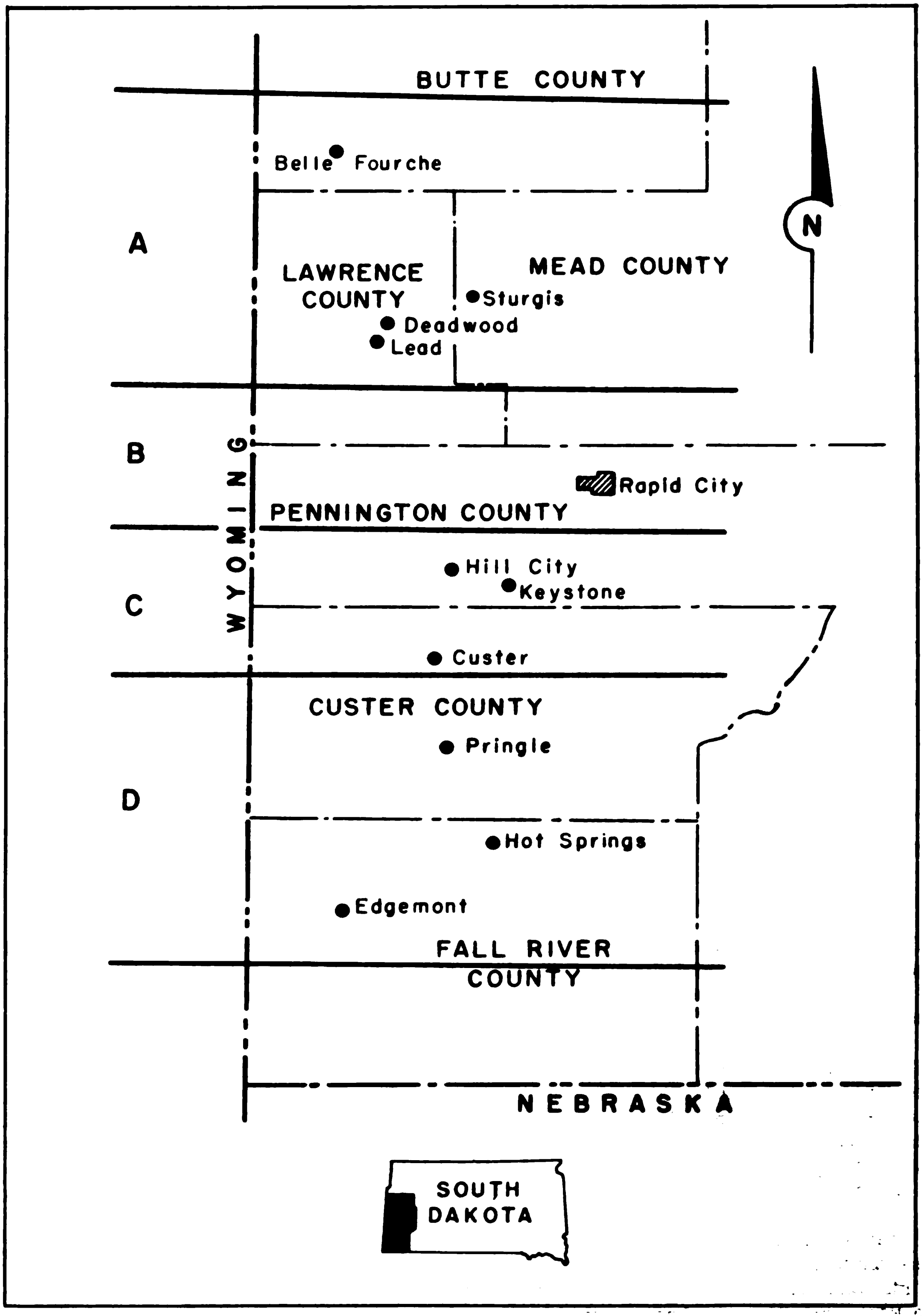

Figure 1. - Index map, Black Hills region, S. Dak.

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Temperatures are generally moderate and permit mining operations throughout the year, although short periods of subzero weather may occur during the winter.

HISTORY AND PRODUCTION

Mining in the Black Hills began with the discovery of gold by a military expedition under the command of General George A. Custer making a reconnaissance of the Black Hills, then a part of the Great Sioux Indian Nation. The discovery was made late in July 1874 near the present site of the town of Custer.

News of the discovery spread rapidly, and, although the Sioux were hostile and military orders were issued forbidding prospecting, several parties succeeded in entering the forbidden area. The Gordon Party, consisting of 26 men, a woman, and a boy, was the largest and reached French Creek, near Custer, in December of 1874. A stockade was built for protection against the Indians and 70 ounces of gold was recovered from placer deposits before the party was ejected by soldiers in April 1875. This was the first mining operation in the Black Hills.

Because of an insistent demand that the area be opened to prospectors, the Government attempted to negotiate with the Indians. When these negotiations failed, the military authorities withdrew their objections and prospecting was resumed, although it was accompanied by considerable bloodshed. A treaty was finally arranged between the Government and the Indians, and the area was ceded to the Government in September 1876. The Black Hills were legally opened to prospecting and settlement on February 28, 1877.

The first rush of gold seekers was towards the town of Custer, but the placers proved low grade, and prospecting advanced north and east with the discovery of rich placers in Deadwood and around Nigger Hill in the northern Black Hills and at Rockerville in the eastern Black Hills. The first placer claim in the northern Black Hills was located on Deadwood Gulch on November 17, 1875. Discovery of placer gold led to the discovery of lode gold. The first lode claims were the Grand and Old Abe located on December 11, 1875, now a part of the Homestake property.

During the first 10 years of mining, operations were under tremendous handicaps because of poor transportation. Machinery and supplies were freighted over long distances by ox team, and only the highest grade ores could be mined profitably. The Fremont, Elkhorn, & Missouri Valley Railway, now a part of the Chicago & Northwestern system, reached Buffalo Gap near the southern edge of the Black Hills in November 1885. It reached Rapid City the following year and entered Deadwood in December 1890. The Chicago, Burlington & Quincy Railway reached the Black Hills by way of Edgemont about the same time and entered Deadwood early in 1891. Branch lines were extended to mines in the northern Black Hills, and these facilities led to the opening of many important deposits. A branch line was built from Hill City to Keystone and assisted in the development of the central Black Hills. The Chicago & Northwestern Railway building westward from Pierre and the Chicago, Milwaukee & St. Paul Railway building westward from Chamberlain entered Rapid City in 1907.

Development of the northern Black Hills was rapid, the principal metal being gold. Some base metals have been produced, but the total is not impressive.

Pegmatite dikes, which occur in both the northern and southern Black Hills but principally in the southern Black Hills, were exploited early when tin was discovered in placer concentrates in 1876. Cassiterite was found in-situ at the Etta mine at Keystone in 1883. A tin boom followed, and many small companies and one large company were formed to exploit the deposits. The largest company was the Harney Peak

Tin Mining, Milling, & Manufacturing Co. This company secured control of most of the tin-bearing dikes but, because of the low grade of the deposits, failed in 1894. Tin production from all deposits has been about 180 tons.

Other pegmatite minerals have been mined almost continuously. Mica was first produced at the Crown mine near Custer in 1879. Other mines, such as the Etta near Keystone, have produced spodumene and other lithia minerals since 1895. Accessory minerals, such as beryl, rose quartz, and columbite-tantalite, have been recovered intermittently since 1914. The production of feldspar, which occurs abundantly in most of the pegmatites, began in 1923. It is now the most important of the pegmatite minerals produced, both in tonnage and in value.

Limestone, sandstone, gypsum, bentonite, and cement are mined and produced in considerable quantity and contribute substantially to the mineral production of the area.

Total production of minerals and mineral products in the Black Hills is given in table 1, and the production for 1951 is given in table 2.

TABLE 1. - Total production of minerals and mineral products from the Black Hills[1]

Product	Period	Amount	Value
Gold	1876-1951	23,322,092 ozs.	$597,870,429
Silver	1876-1951	10,285,424 ozs.	7,440,743
Lead	1877-1951	485 tons	56,406
Zinc	1906-1951	265 tons	56,406
Copper	1897-1951	106 tons	36,466
Pegmatite minerals[2]	1879-1951	-	9,162,695
Tungsten (other than pegmatite)	1898-1950	-	1,347,852
Iron ore	1893-1950	68,804 long tons	310,767
Pyrite	? -1928	-	130,000
Arsenic	1924-1925	89 tons	7,167
Bentonite	1917-1951	-	17,115,496
Gypsum	1884-1948	350,176 tons	1,711,499
Sandstone (estimated)	1884-1950	-	[3]696,450
Limestone	1896-1950	-	4,913,798
Lime	1896-1949	186,951 tons	1,733,502
Cement	1925-50	13,333,348 barrels	[3]20,640,519
Heavy clay products	? -1950	-	[3]1,077,549

[1] Bureau of Mines figure unless otherwise noted.

[2] Beryl, columbium-tantalum, feldspar, lithium minerals, mica, tin, tungsten, pollucite, andalusite-sillimanite and rose quartz.

[3] Mineral Resources of South Dakota.

TABLE 2. - Production of minerals and mineral products in the Black Hills, 1951

Product	Amount	Value
Gold....................	458,101 ozs.	[1]$16,033,535
Silver..................	139,590 ozs.	[1]126,336
Iron ore................	[2]12,601 tons	?
Pegmatite minerals[3]....	62,816 tons	[2]1,066,745
Bentonite[4].............	-	[2]1,766,522
Cement..................	1,020,868 barrels	[2]1,512,326
Limestone and lime......	439,630 tons	[2]718,348
Brick and tile[5]........	17,549 tons	[2]77,347

[1] Bureau of Mines figure unless otherwise noted.

[2] Mineral Resources of South Dakota.

[3] Beryl, columbium-tantalum, feldspar, lithium minerals, mica, and rose quartz.

[4] 1950 production, 1951 confidential.

[5] 1950 production, 1951 not available as separate figure.

GENERAL GEOLOGY

The Black Hills region is a truncated dome of Paleozoic and Mesozoic sedimentary rocks dipping gently outward from the center. A basement of pre-Cambrian metamorphic rocks has been exposed by erosion. The metamorphics have been intruded by the Harney Peak granite and by a host of small associated pegmatite dikes, all of pre-Cambrian age.

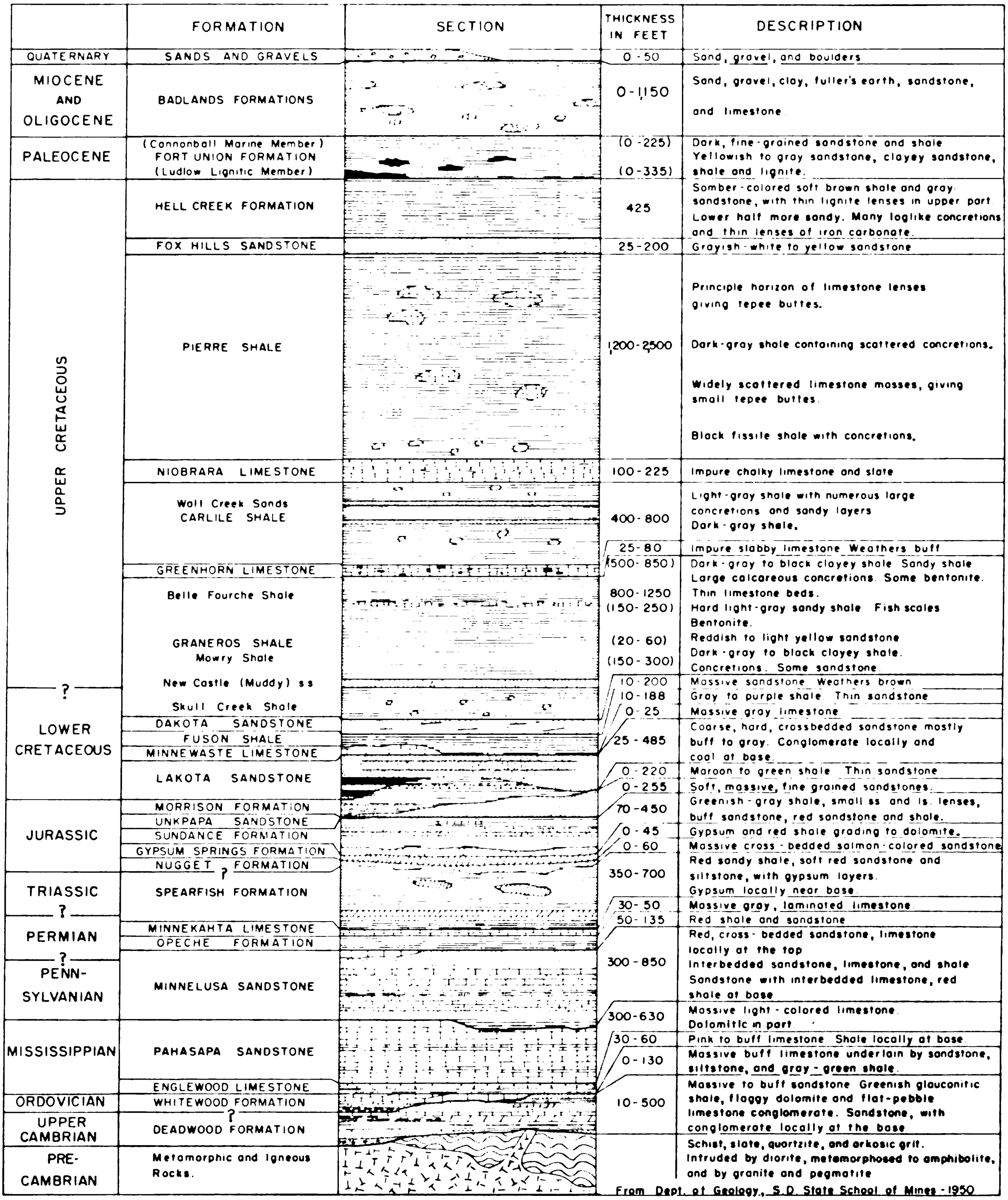
The metamorphic rocks were eroded enough to expose the Harney Peak granite before the beginning of Paleozoic deposition. During Paleozoic and Mesozoic time roughly 6,000 feet of sediments were laid down over the site of the present Black Hills. Doming at the end of the Mesozoic and at least two subsequent uplifts have permitted erosion to remove the entire sedimentary sequence and to carve the highest part of the Black Hills from the once deeply buried granite. Extensive igneous activity occurred in the northern Black Hills in early Tertiary time. Figure 2 shows a generalized columnar geological section of the Black Hills.

COMPILATION OF THE ATLAS

Because of the many mineral properties it was found convenient to divide the Black Hills region into four parts, areas A, B, C, and D. Mineral properties in each of the areas were given a serial number containing the area designation.

Three indexes of mineral properties were prepared for each area, and those for areas C and D are contained in this report. The first index for each area is a list of the names of the mineral properties in alphabetical order and contains also the mineral commodity or commodities and serial number for each property. The second index is a list of mineral properties in numerical order, according to their serial numbers, and in addition contains the names and mineral commodities of the properties. The third index is a commodity index and contains the names and serial numbers of the mineral properties under their mineral or metal commodity.

The indexes for each area are followed by descriptions of the properties for each area in the order of their serial numbers.



THICKNESS IN FEET	DESCRIPTION
0 - 50	Sand, gravel, and boulders
0-1150	Sand, gravel, clay, fuller's earth, sandstone, and limestone
(0 -225)	Dark, fine-grained sandstone and shale
(0-335)	Yellowish to gray sandstone, clayey sandstone, shale and lignite.
425	Somber-colored soft brown shale and gray sandstone, with thin lignite lenses in upper part. Lower half more sandy. Many loglike concretions and thin lenses of iron carbonate.
25-200	Grayish-white to yellow sandstone
1200-2500	Principle horizon of limestone lenses giving tepee buttes. Dark-gray shale containing scattered concretions. Widely scattered limestone masses, giving small tepee buttes. Black fissile shale with concretions.
100-225	Impure chalky limestone and slate
400-800	Light-gray shale with numerous large concretions and sandy layers Dark-gray shale.
25-80	Impure slabby limestone Weathers buff
(500-850)	Dark-gray to black clayey shale Sandy shale Large calcareous concretions. Some bentonite.
800-1250	Thin limestone beds.
(150-250)	Hard light-gray sandy shale Fish scales Bentonite.
(20-60)	Reddish to light yellow sandstone
(150-300)	Dark-gray to black clayey shale. Concretions. Some sandstone.
10-200	Massive sandstone Weathers brown
10-188	Gray to purple shale Thin sandstone
0-25	Massive gray limestone
25-485	Coarse, hard, crossbedded sandstone mostly buff to gray. Conglomerate locally and coal at base.
0-220	Maroon to green shale Thin sandstone
0-255	Soft, massive, fine grained sandstones.
70-450	Greenish-gray shale, small ss and ls. lenses, buff sandstone, red sandstone and shale.
0-45	Gypsum and red shale grading to dolomite.
0-60	Massive cross-bedded salmon-colored sandstone
350-700	Red sandy shale, soft red sandstone and siltstone, with gypsum layers. Gypsum locally near base.
30-50	Massive gray, laminated limestone
50-135	Red shale and sandstone
300-850	Red, cross-bedded sandstone, limestone locally at the top Interbedded sandstone, limestone, and shale Sandstone with interbedded limestone, red shale at base
300-630	Massive light-colored limestone. Dolomitic in part
30-60	Pink to buff limestone Shale locally at base.
0-130	Massive buff limestone underlain by sandstone, siltstone, and gray-green shale.
10-500	Massive to buff sandstone Greenish glauconitic shale, flaggy dolomite and flat-pebble limestone conglomerate. Sandstone, with conglomerate locally at the base.
	Schist, slate, quartzite, and arkosic grit. Intruded by diorite, metamorphosed to amphibolite, and by granite and pegmatite

From Dept. of Geology, S.D. State School of Mines - 1950

Figure 2. - Black Hills generalized columnar section.

For each of the properties included in this atlas it would be desirable to have complete information as to location, ownership, commodity, geology, history, production, and bibliography. Because of a lack of information concerning older properties and because of limitations of space and time, obviously it was not possible to include all data on all properties listed. Emphasis has been placed on legal location, commodity or commodities produced or available, and upon complete references in the literature.

Location

This is the first attempt in compiling a list of the Black Hills mining properties with an accurate and legal location for each. Where possible, the property has been located to the nearest quarter section. Larger holdings have been indicated by sections or townships.

Ownership

Ownerships of mineral properties are included in this report where such information was available. As far as the larger producers are concerned, this information is reasonably reliable. But small properties change hands frequently, and the older claims have reverted or are involved in litigation in many instances. In some cases no ownership has been listed; in other cases the name of the last known owner has been given. It is felt that, with accurate legal location of a property, any interested person can easily consult Courthouse records for the current ownership.

Commodity

Properties are indexed by commodity regardless of whether shipments have actually been made. Listings are simple in the case of most of the metal mines but are complicated in the pegmatites, which may contain six or more potentially valuable minerals.

Geology

The geology has been covered in one to three sentences in most cases. An effort has been made to include the size, attitude, and type of mineralization. Further details must be obtained from the literature or from a field examination.

History

A majority of the properties listed are now of only historical interest. Many of them have been operated by several different companies or individuals. Where possible, the names of all such companies have been included in the historical sketch. Where claims have been relocated under new names, all known names are listed in the alphabetical index.

Production

Production figures for individual mines are difficult to obtain and are frequently incomplete and unreliable. They have been given where possible. They cannot be used as a guide to the current value of any property.

Bibliography

The bibliography is the most complete, and perhaps the most valuable, part of the atlas. On most properties the bibliography is essentially complete. However, in the case of well known mines, such as the Homestake, the literature contains dozens of references. In the atlas only the more recent or complete are included. These in turn, usually contain very complete bibliographies.

Most of the information was obtained from government publications, particularly those of the Geological Survey and the Bureau of Mines. The bulletins and reports of the South Dakota School of Mines and Technology and the State Geological Survey furnished additional valuable information. Scattered references were found also in numerous well-known geological and mining periodicals. These are all readily available in most technical libraries.

More difficult to obtain are the reports of the State Mine Inspector and the State Planning Board. A complete file of the old Black Hills Mining Review and the Black Hills Industrial Review is available in the library of the School of Mines and Technology at Rapid City. Since the very numerous references in these local publications would congest the footnotes, much historical material has been taken from these sources without specific credit.

Nonconfidential information in the files of the Geological Survey and the Bureau of Mines has been drawn upon freely and often without credit. Unpublished theses and reports have usually been credited to the author in the text. Much information has been obtained orally from local persons interested in the compilation of this atlas.

AREA C

Geology

This area lies in the south central part of the Black Hills. It comprises Tps. 1, 2, and 3S., Rs. 1, 2, 3, 4, 5, 6, and 7E. It covers the southwest corner of Pennington County and the north half of Custer County. It is drained by Spring, Grace Coolide (Squaw), Battle, and French Creeks. It includes all of the Hill City and Keystone mining districts, and most of the Custer district, figure 3.

The entire area is included in Folio 219 (Central Black Hills) of the Geologic Atlas of the United States (17).[2]

Pre-Cambrian Rocks

The central part of this area consists of pre-Cambrian metamorphic and igneous rocks. Intensely folded schists, quartzites, slates, and amphibolites have been intruded by the Harney Peak granite and subsequently by innumerable pegmatite dikes closely associated with the granite.

Minerals found within the pre-Cambrian rocks of this area include gold and silver associated with quartz veins at Keystone, Hill City, and Custer; lead-silver ores at Spokane; pyrite and traces of copper associated with graphitic schist in the vicinity of Sheridan Lake and Spokane; hematite at Iron Mountain; tungsten- and tin-bearing quartz veins near Hill City; and the pegmatite minerals discussed below.

The pegmatites occur in areas partly surrounding the Harney Peak batholith, especially along the northeastern and southwestern margins. Other pegmatites, not yet exposed by erosion, may exist below the unconformable cover of Paleozoic rocks.

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[2] Underlined numbers refer to publications listed in the bibliography at the end of this report.

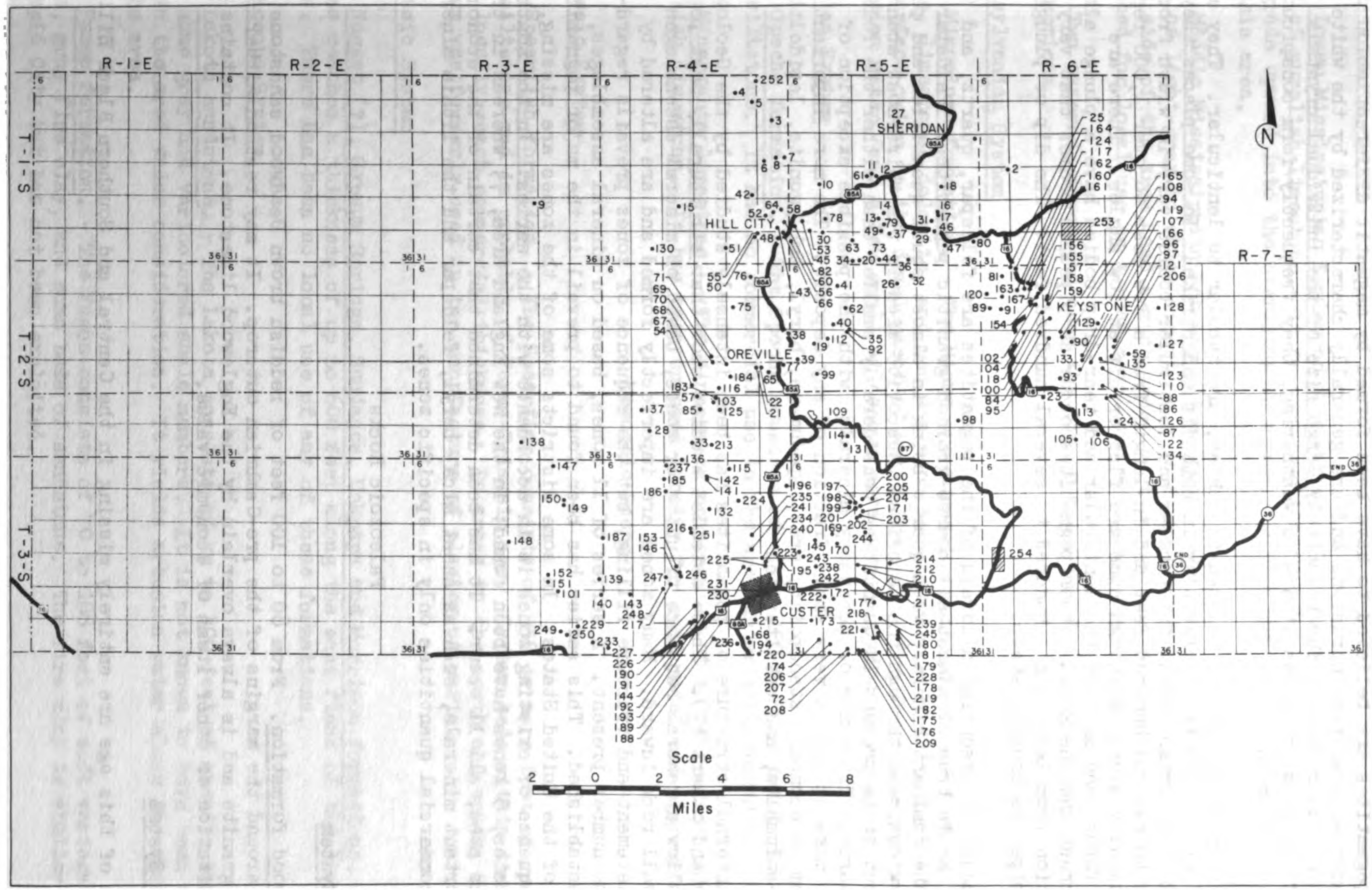

Figure 3. - Location map, area C.

The pegmatites are believed to have been formed by magmatic differentiation of the pre-Cambrian granitic intrusions and are generally characterized by the white to gray color of the rocks and the relatively large size of the individual crystals. Because of their superior resistance to weathering, they frequently form conspicuous topographic features.

Many pegmatites, where enclosed in schist, are tabular to lenticular. They are generally parallel to the schistosity in both dip and strike. In some places they are parallel in strike only. The tabular and lenticular bodies vary in width from a few inches to several hundred feet and in length from a few feet to over 1,000 feet. Dips are usually steep, although some are flat or dip at low angles. There are tear-drop forms, and most of the lenticular and tear-drop bodies have a plunge along both the crest and the keel. Other pegmatites occur as pipelike bodies that vary in cross section from less than 1 hundred to several hundred feet. The dip or plunge of these pipes is usually steep.

The major or essential minerals of the pegmatites are feldspar, quartz, and muscovite, as is true of almost all coarse-grained granitic pegmatites. Feldspar is probably the dominant mineral, with quartz being in almost equal quantities and perhaps more widespread through the deposits. Muscovite mica is the third most abundant mineral, but it is present in quantities considerably smaller than either the feldspar or quartz. The minor or accessory minerals, with the possible exception of spodumene, make up only a very small fraction of any deposit. The more important of these, from an economic standpoint, are: Spodumene, beryl, amblygonite, lepidolite, tantalite-columbite, and cassiterite.

The internal structure of pegmatites has been intensely studied by the Geological Survey and others (7). These detailed studies show that structurally most pegmatites follow a general sequence of units or zones, based on mineral assemblages from the wall rock inward. Many zones are imperfectly formed and are altered by later replacement and fracture filling, but the sequence of zones prevails regardless of the number present. A series of 11 zones, based on mineral assemblages, has been established. This series has been found to prevail in the major pegmatite districts of the United States. In some districts some of the zones are missing, but the sequence of existing zones is in accordance with the series. In the southeastern States, 5 zones have been found; in the New England area, 7; whereas in the Black Hills area, all 11 occur. It has been determined that certain of the economically important minerals, such as sheet mica, beryl, feldspar and the lithia minerals, occur in commercial quantities only in specific zones.

Paleozoic Rocks

Cambrian System

Deadwood formation. From 80 to 100 feet of reddish brown Deadwood sandstone crops out around the margins of the pre-Cambrian outcrop. It may rest on either schist or granite and is always overlain by the Englewood limestone. It contains no mineralization or other items of economic value.

Ordovician System

Rocks of this age are entirely missing in the Central and Southern Black Hills.

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Mississippian System

Lower Mississippian Englewood formation. - The Englewood consists of 30 to 50 feet of purplish limestone. It is very argillaceous in its lower part and appears to grade upward into the overlying Pahasapa. No use has been made of the Englewood in this area.

Middle Mississippian Pahasapa limestone. - The Pahasapa consists of 300 to 500 feet of light-gray to white limestone. It forms a narrow outcrop belt across the east side of the area, and a much wider belt across the west side. It has been crushed for local use as a road metal and as aggregate.

Two caverns, developed near the top of the formation, are open as tourist attractions.

Pennsylvanian System

Minnelusa formation. - The Minnelusa formation consists of 700 feet of sandstone, limestone, dolomite, and red shale on the outcrops. It thickens somewhat in subsurface owing to the development of anhydrite beds. The formation carries some artesian water, and a few small oil shows have been reported by drillers.

Permian System

Opeche formation. - The Opeche consists of 90 to 120 feet of brick-red shale and siltstone. It has no commercial use in the area under consideration.

Minnekahta limestone. - The Minnekahta consists of 40 to 60 feet of thin-bedded purplish limestone. It has been crushed locally for road metal and aggregate.

Mesozoic Rocks

Triassic System

Spearfish formation. - The Spearfish consists of 350 or more feet of red shale and siltstone and is probably of Permo-Triassic age. Gypsum beds within the formation locally reach commercial thickness. In areas to the north and south, Spearfish gypsum was formerly used in the manufacture of plaster of paris.

Jurassic System

Nugget (?), Gypsum Springs, Sundance, Unkpapa and Morrison formations. - This series reaches a thickness of up to 600 feet along the east flank of the Black Hills. There has been no local use of any of these formations.

Cretaceous System

Lakota sandstone. - The Lakota consists of up to 400 feet of massive sandstone with some gray and varicolored shale members. It is not known to have been quarried within the area under consideration. It yields artesian water along the east edge of the area.

Fuson formation. - The Fuson consists of 70 to 188 feet of soft variegated clays, gray fire clay, and some beds of sandstone. The fire clay is similar to that at Rapid City but has not been exploited.

Dakota formation. - The Dakota consists of up to 80 feet of sandstone with thin shale beds. It has been quarried for building stone in the areas to the north and south. It is an important source of artesian water along the east edge of the area.

Graneros formation. - The Graneros, which reaches a total thickness of about 800 feet east of the Black Hills, can be divided as follows:

	Feet
Belle Fourche shale member....	300-400
Mowry siliceous shale member..	150-200
Newcastle sandstone member....	0-20
Skull Creek shale member......	200-250

On the southeast side of the Black Hills no commercial bentonites are present, and efforts to locate oil in the Newcastle sandstone have been unsuccessful.

Greenhorn formation. - This 45- to 60-foot formation consists of slabby limestone and calcareous shale. It has been used by ranchers for building foundations, bridge abutments, and as riprap on stock dams.

Carlile formation. - The Carlile consists of up to 450 feet of dark-gray marine shale with large limestone concretions. Sandstones within this formation produce oil on the west flank of the Black Hills.

Niobrara formation. - The Niobrara consists of about 200 feet of chalky shale. It has not been exploited in the Black Hills area.

Pierre formation. - On the east side of the Black Hills the Pierre formation consists of up to 1,200 feet of dark-gray marine shale. The Ardmore bentonite extends into this area but has not been developed.

Fox Hills and Hell Creek formations. - These do not crop out east of the Black Hills, but cover extensive areas in the northwestern part of the State.

Cenozoic Rocks

Fort Union formation. - This formation, which covers a large area in the northwestern corner of the State, does not crop out in the area under consideration.

Oligocene-White River formation. - The White River clays are best known to the southeast, where erosion has carved them into intricate "badlands." Close to the Black Hills the formation is much coarser. High terrace gravels have supplied road gravel locally, and on some of the larger terraces north and south of Hermosa the gravels contain enough water to supply ranch wells. Deposits of Fuller's earth and volcanic ash are known but have no commercial value at this time.

Quaternary and Recent Rocks

Gravels of relatively recent origin occur in present stream valleys and in terraces at several levels above the present drainage. Gold, tin, and some tungsten have been recovered from placer gravels in the area.

In 1924 the Chicago & Northwestern Railroad opened a pit in terrace gravels a mile south of Hermosa for use as roadbed ballast on their Chadron line.

Mines and Mineral Deposits

Alphabetical Index, Area C

Name	Commodity	Serial No.
Aberdeen Gold Mining & Milling Co. (J. R. Extension)......................	Gold, silver..................	See C-12
Addie lode.............................	Tin...........................	C-49
Aladdin................................	Mica, feldspar................	C-215
American Tungsten Mining Co.	Tungsten......................	C-37
A. M. lode.............................	Feldspar......................	C-199
Annie No. 1 lode.......................	Tin, tungsten.................	C-43
Antler-Burlington......................	Gold, silver..................	C-7
Arcade Nos. 1 and 2 lodes..............	Mica..........................	C-214
Ballard mine...........................	Mica, beryl, feldspar.........	C-216
Bare Top No. 2 lode....................	Feldspar......................	C-207
Bates J. O. claim (Custer group)........	Tin...........................	See C-78
Battle Axe (Sunflower).................	Gold, silver..................	See C-15
Bebington group........................	do.	C-144
Beck lode..............................	Feldspar......................	C-180
Beckman, General Custer, Gold Coin groups..................................	Gold, silver..................	C-164
Beryl Feldspar mine....................	Feldspar, mica, beryl.........	C-87
Bet lode...............................	Feldspar......................	C-205
Big Chief..............................	Feldspar, mica, beryl.........	C-88
Big Hit................................	Gold, silver..................	C-165
Big Horn lode..........................	Feldspar......................	C-195
Big Shot...............................	Feldspar, beryl...............	C-89
Big Smoke..............................	do.	C-86
Big Spar No. 1 mine....................	Feldspar, mica................	C-217
Bismark-Ida Florence group.............	Gold, silver..................	C-162
Black Bird.............................	Tungsten......................	C-26
Black Crystal..........................	do.	C-27
Black Diamond..........................	do.	C-28
Black Metal group......................	Tin, tungsten.................	C-10
Blue Bird claim........................	Tin...........................	C-51
Blue Bonnet claim (Star)...............	Mica, beryl...................	See C-218
Blue Lead (Maloney Blue Lead)...........	Copper........................	C-1
Buckeye & Lena group (Union Hill).......	Gold, silver..................	C-3
Bull Con (Edison mine).................	Spodumene, mica...............	See C-94
Bull Moose.............................	Feldspar......................	C-208
Bullion mine...........................	Gold, silver..................	C-156
Burgess mica prospect..................	Mica..........................	C-220
Burt mica mine.........................	do.	C-221
Butler (Ingersoll, Horace Greeley)......	Lithium, beryl, mica..........	See C-81
Butte (Truax group)....................	Tin...........................	C-70
Campaign...............................	do.	C-52
Canfield lode (High)...................	Tungsten......................	See C-34
Carnbray, Snow Shoe, Tin Belle..........	Tin...........................	C-61
Carroll Property (Terry & Terry No. 1 claims)...............................	Mica..........................	See C-242
Cassiterite............................	Tin...........................	C-58
Central Black Hills gold mine (Antler-Burlington).........................	Gold, silver..................	See C-7
Century (Mateen).......................	Lithium, tin..................	See C-56
Champion...............................	Feldspar, beryl...............	C-133

Name	Commodity	Serial No.
Champion property	Tungsten, tin	C-29
Cheyenne lode	Mica	C-85
Clara Belle (Golden Arrow-Forest City)	Gold, silver, tin	C-21
Climax mica mine	Mica	C-222
Coats Dike	Tin, tungsten	C-50
Colossal (White Whale group)	Tin	See C-53
Columbia (Maiden) mine	Gold, silver	C-157
Come Along lode	Feldspar	C-170
Confidence	Feldspar, mica	C-90
Continental Copper Co. (Dakota Calumet)	Copper	See C-2
Cowboy	Tin	C-55
Crain	Gold, silver	C-252
Crown mine (McMackin)	Mica, beryl	C-251
Cumberland (M. R.)	Gold, silver	See C-11
Custer claim (Old Jeff)	Tin	See C-132
Custer group	do.	C-78
Custer mica lodes Nos. 1 & 2	Mica	C-223
Custer Mountain (Snookum) lode	Feldspar, mica, beryl	C-173
Cuyahoga	Pyrite	C-23
Czar, Czar 1, Czar 2 (Tenderfoot group)	Tin	See C-54
Dakota Calumet (Continental Copper Co.)	Copper	C-2
Dalmon mica mine	Mica	C-225
Dan Patch	Feldspar, mica, beryl	C-91
Deacon Wright	Tin	C-67
Dewey mine	Mica, spodumene, feldspar	C-92
Dike (Dyke)	Feldspar, mica, amblygonite	C-93
Dorothy lode	Feldspar, mica	C-192
Dorothy No. 1 lode	Feldspar	C-193
Dorothy V prospect	Mica	C-226
Dubuque and Royal Flush claims	Mica, beryl	C-227
Dyke	Tungsten	C-30
Earl lode	Feldspar, mica, beryl	C-228
Echo	Gold, silver	C-151
Eclipse group	do.	C-166
Edison mine (Hector Fraction)	Spodumene, mica	C-94
Edna Hazel	Tungsten	C-31
Egyptian group	Gold, silver	C-160
El Dorado	Gold, silver, tungsten, tin	C-14
El Dorado (Old Bill)	Gold, silver	See C-136
Elkhorn (Tinsley mine)	Feldspar, mica, beryl	See C-181
Elkhorn tungsten property	Tungsten	C-36
E. M. lode	Feldspar	C-198
Equality (King Lithia prospect)	Lithium, beryl	See C-107
Etta	Spodumene, feldspar, mica	C-95
Eureka	Feldspar, mica	C-96
Excelsior	Tin	C-62
February group	do.	C-73
Ferguson	Feldspar, beryl	C-97
Fern Cliff prospect	Tungsten	C-134
First Find	Tin	C-77
Flora	do.	C-72
Forest City (Clara Belle)	Gold, silver, tin	See C-21
Forrest City	Gold, silver	C-17
Formoso	Mica	C-98
Forty-Five lode	Feldspar	C-187

Name	Commodity	Serial No.
Friday lode	Feldspar	C-246
Gap lode	Mica, feldspar	C-99
General Custer (Beckman)	Gold, silver	See C-164
General Grant (First Find)	Tin	See C-77
General Harney (Tin Boom)	do.	See C-64
Gertie	do.	C-48
Gilt Edge	Mica	C-100
Gira's claim	Tungsten	C-46
Gira and Ainsley's Dike	Feldspar	C-184
Glendale	Beryl, feldspar, tin	C-135
Gold Coin group (Beckman)	Gold, silver	See C-164
Gold Dust (El Dorado)	Gold, silver, tungsten, tin	See C-14
Gold Fish	Gold, silver	C-142
Gold Hill (Gold lode)	do.	C-4
Gold Hill claim (North Star)	do.	See C-147
Gold Hill lode	do.	C-159
Gold Medal (Golden Summit)	do.	See C-20
Gold Reserve (Saginaw)	do.	See C-138
Gold Star (Edison mine)	Spodumene, mica	See C-94
Golden Arrow (Clara Belle)	Gold, silver, tin	See C-21
Golden Crown (Leroy mine)	Gold, silver	C-141
Golden Erie (North Star)	do.	See C-147
Golden Slipper	do.	C-16
Golden Slipper (Tin Boom)	Tin	See C-64
Golden Summit (Gold Medal)	Gold, silver	C-20
Good Luck (American Tungsten Mining Co.)	Tungsten	See C-37
Grand Island group	Gold, silver	C-167
Grand Junction & Hartford group	do.	C-137
Grant (Wild Rose)	do.	See C-145
Great Eastern (Old Jeff)	Tin	See C-132
Great Northern (Old Mike)	Mica, beryl	See C-115
Greenback group	Gold, silver	C-8
Grizzly Bear	do.	C-19
Halcyon (Joe Dollar)	do.	C-18
Hardesty Homestead	Beryl, mica, tantalite	C-80
Hard Scrabble (North Star)	Gold, silver	See C-147
Hartford group (Grand Junction)	do.	See C-137
Hector Fraction (Edison mine)	Spodumene, mica	See C-94
Hedman mine (Victory)	Mica	See C-243
Heidepriem & Cattles mine	Feldspar	C-168
Henry Tin	Tin, beryl	C-102
High (Canfield) lode	Tungsten	C-34
High Climb	Feldspar, beryl, mica, amblygonite	C-103
Highland (Ross mine)	Feldspar, beryl	See C-143
Highview prospect	Beryl, lithium	C-229
Hofert Arcade (Victory No. 1)	Mica	See C-244
Holy Smoke (Vulcan)	Gold, silver	See C-25
Holy Terror mine	do.	C-154
Homestead No. 2 prospect	Mica	C-230
Homestead No. 3 prospect	Mica	C-231
Hopeful (Samelias)	Tin	See C-47
Horace Greeley (Ingersoll, Butler)	Lithium, beryl, mica	See C-81
Hot Shot mine	Feldspar, mica	C-179
Hugo mine	Feldspar, mica, beryl	C-104

Name	Commodity	Serial No.
Ida (Ida Tin)	Tin, lithium	C-79
Independence lode	Feldspar	C-248
Independence No. 1 lode	do.	C-247
Ingersoll (Greeley, Butler)	Lithium, beryl, mica	C-81
Ivanhoe district	Gold, silver	C-254
IXL Fraction	Feldspar	C-212
IXL lode	do.	C-210
IXL lode No. 3	do.	C-202
IXL No. 4 lode	do.	C-211
Jackson (Custer group)	Tin	See C-78
Japanzy (Tenderfoot group)	do.	See C-54
Jolly group	do.	C-63
Josie	Mica	C-106
J. R. (Cumberland)	Gold, silver	C-11
J. R. Extension (Aberdeen Gold Mining & Milling Co.)	do.	C-12
Jumbo lode	Feldspar, mica, beryl	C-105
Juniper mine	Gold, silver	C-117
Kammon C. H. (Martha Washington)	Tungsten	See C-32
Keystone lode	Mica	C-233
Keystone mine	Gold, silver	C-155
King Lithia prospect	Lithium, beryl	C-107
King Mica (White Cap, Primer)	Feldspar, beryl, mica	C-108
Kirka (Downing) claim	Tungsten	C-33
Knowles lode claim	Quartz crystals	C-234
La Grande (White Whale group)	Tin	See C-53
Lake (Lakeside)	Mica	C-109
Langford (Mohawk Mica)	do.	See C-239
Lee Burrow's Dike	Feldspar	C-178
Legal Tender group	Gold, silver	C-163
Leroy mine (Golden Crown)	do.	See C-141
Liberty Bell (Tin Center)	Tin	See C-82
Lillian (Dakota Calumet)	Copper	See C-2
Lost Bonanza mine	Mica	C-235
Louise & Hunter	Lithium, tin	C-57
Lucky Bird	Gold, silver	C-152
Lucky Boy	do.	C-158
Lucky Spar	Feldspar	C-194
Lucky Star prospect	Mica	C-236
Lulu tin lode (First Find)	Tin	See C-77
Maderposen	Feldspar, beryl	C-110
Maiden (Columbia mine)	Gold, silver	See C-157
Martha Washington (C. H. Kammon)	Tungsten	C-32
Maryland lode (Olds lode)	Feldspar, mica	C-111
Mastiff	Copper	C-9
Mateen (Century)	Lithium, tin	C-56
McKinnon & Miller's claim	Tungsten	C-35
McMackin (Crown mine)	Mica, beryl	See C-251
Mewanitoc (White Whale group)	Tin	See C-53
Mica King mine	Feldspar, mica	C-182
Mica King No. 3 claim	Mica, feldspar	C-219
Mica Queen No. 1 prospect	Mica	C-238
Michigan Placer Ground	Tungsten	C-40
Midway Fraction (El Dorado)	Gold, silver, tungsten, tin	See C-14
Mineral Hill (Oneota)	Gold, silver	See C-146

Name	Commodity	Serial No.
Minnie May group	Gold, silver	C-153
Mitchell No. 1 lode	Feldspar	C-209
Mitchell No. 2 lode	do.	C-204
Mohawk Mica (Langford)	Mica	C-239
Mohawk	Tin	C-60
Monarch (Peerless prospect)	Mica, beryl	See C-118
Monitor (Peerless prospect)	do.	See C-118
Monkey lode	Feldspar, beryl, mica	C-112
Mountain Lion (Soda Spar)	Feldspar, beryl, lithium, mica	See C-126
Naiad Queen	Tin	C-68
Nathaniel Pope	Gold, silver	C-161
Nevada No. 2	Tin	C-74
Newark group	Gold, silver	C-139
New Deal lode	Feldspar	C-171
New England	Feldspar, beryl	C-113
Noble Mica	Mica	C-131
North Star (Hard Scrabble)	Gold, silver	C-147
November mine	Feldspar, mica	C-114
Occidental	Tin	C-101
OK lode	Feldspar	C-201
OK lode	Gold, silver	C-5
OK No. 2 lode	Feldspar	C-197
OK No. 4 lode	do.	C-203
Old Bill (El Dorado)	Gold, silver	C-136
Old Jeff (Tin Reef)	Tin	C-132
Old Mike (Great Northern)	Mica, beryl	C-115
Olds lode (Maryland lode)	Feldspar, mica	See C-111
Olympia	Tin	C-76
Oneota (Mineral Hill)	Gold, silver	C-146
Opulent claim (North Star)	do.	See C-147
Oreville Spar	Feldspar, mica	C-116
Ottershagen prospect	Beryl	C-206
Ottumwa	Tungsten, tin	C-83
Owl claim (North Star)	Gold, silver	See C-147
Peerless (Monarch)	Mica, beryl	C-118
Penobscot	Gold, silver	C-150
Pettit & Pfander's claim	Tungsten	C-41
Phelps lode (Roosevelt)	Feldspar	C-224
Phillip & Phyllis lodes (Watson)	do.	See C-129
Pick lode	do.	C-200
Pinecone (Wayside lode)	Feldspar, mica	See C-175
Pink Elephant beryl prospect	Beryl, mica	C-119
Plate mica prospect	Mica, beryl	C-120
Ponca group	Feldspar, mica, beryl	C-121
Poppy lode	Feldspar	C-196
Primer (King Mica)	Feldspar, mica, beryl	See C-108
Protector (Peerless)	Mica, beryl	See C-118
Put	Beryl	C-122
Queen claim	Beryl, feldspar	C-123
Rambler lode	Feldspar	C-174
Raver & Michaud mine	do.	C-190
Reinbold claim	Tungsten	C-38
Ridge lode	Feldspar	C-191
Roosevelt group (Rough Rider)	Gold, silver	See C-149
Roosevelt (Phelps lode)	Feldspar	See C-224

Name	Commodity	Serial No.
Ross (Highland) mine	Feldspar, beryl	C-143
Rough Rider (Roosevelt group)	Gold, silver	C-149
Royal Flush claims (Dubuque)	Mica, beryl	See C-227
Saginaw (Gold Reserve)	Gold, silver	C-138
Sally Cavanaugh	Tin, mica	C-69
Samelias (Hopeful)	Tin	C-47
Sarah group	Tin, tantalum	C-84
Saw lode	Feldspar	C-213
Shamrock No. 1 lode	do.	C-172
Sitting Bull	Beryl, mica	C-124
Sky lode	Lithium	C-125
Snookum (Custer Mountain)	Feldspar, mica, beryl	See C-173
Soda Spar (Mountain Lion)	Feldspar, beryl, lithium, mica	C-126
Sonny Boy lode	Feldspar	C-176
Spar (Custer group)	Tin	See C-78
Spokane	Gold, silver, lead, zinc	C-24
Star lode	Lithium, beryl	C-127
Star & Blue Bonnet claims	Mica, beryl	C-218
St. Elmo (Western Belle)	Gold, silver	C-22
Straussburg (North Star)	do.	See C-147
Success (American Tungsten Mining Co.)	Tungsten	See C-37
Sunflower (Battle Axe)	Gold, silver	C-15
Sunnyside	do.	C-6
Sunrise lode	Feldspar	C-186
Sunset lode	do.	C-185
Sunshine mica prospect	Mica	C-241
Surprise mica mine	do.	C-240
Sylvanite lode	Feldspar	C-169
Tea and Dolcode	Gold, silver	C-13
Tenderfoot group (Czar & Japanzy)	Tin	C-54
Tepee Gulch area	Gold, silver	C-253
Terry & Terry No. 1 claims (Carroll)	Mica	C-242
Tiger lode	Lithium	C-128
Tillison's mine	Feldspar, mica	C-177
Tin Boom (General Harney, Tin Spike No. 1)	Tin	C-64
Tin Center (Liberty Bell)	do.	C-82
Tin Chance & No. 1	do.	C-66
Tin City (Tin King)	do.	See C-71
Tin King (Tin City)	do.	C-71
Tin Mountain mine	Feldspar, lithium, pollucite	C-249
Tin Plate	Tin	C-75
Tin Queen (White Blowout)	Tin, lithium, mica, feldspar	C-65
Tin Reef claim (Old Jeff)	Tin	See C-132
Tin Spike No. 1 (Tin Boom)	do.	See C-64
Tinsley (Elkhorn)	Feldspar, mica, beryl	C-181
Top Sheaf (Custer group)	Tin	See C-78
Trail Hill feldspar dike (Big Smoke)	Feldspar, beryl	See C-86
Truax group (Butte)	Tin	See C-70
Tungsten lode	Tungsten	C-39
Turk group	Gold, silver	C-140
Union Hill (Buckeye & Lena group)	do.	See C-3
Victory (Hedman) mica mine	Mica	C-243
Victory No. 1 prospect (Hofert Arcade)	Mica	C-244
Vida May	Tungsten	C-44

Name	Commodity	Serial No.
Vulcan (Holy Smoke)......................	Gold, silver..................	C-25
Walsh mica prospect......................	Mica..........................	C-245
Warren Draw mine.........................	Feldspar, beryl...............	C-250
Watson (Phillip & Phyllis lodes).......	Feldspar......................	C-129
Wayside lode (Pinecone)..................	Feldspar, mica................	C-175
Western Belle (St. Elmo).................	Gold, silver..................	See C-22
Western Feldspar.........................	Feldspar......................	C-130
Western Star.............................	Gold, silver..................	C-148
Westinghouse No. 2 (White Spar mine)....	Mica..........................	See C-188
White Blowout (Tin Queen)................	Tin, lithium, mica, feldspar..	See C-65
White Cap (King mica)....................	Feldspar, beryl, mica.........	See C-108
White Dog mica mine......................	Mica..........................	C-189
White Spar mine (Westinghouse No. 2)....	do.	C-188
White Swan...............................	Tungsten......................	C-45
White Whale group........................	Tin...........................	C-53
Wild Rose (Grant)........................	Gold, silver..................	C-145
Wilhelm mine.............................	Feldspar......................	C-237
Wolfram lode.............................	Tungsten......................	C-42
Wood Tin.................................	Lithium, beryllium............	C-59

Numerical Index

Serial No.	Name	Commodity
C-1	Blue Lead (Maloney Blue Lead)...............	Copper
C-2	Dakota Calumet (Continental Copper Co.)....	Do.
C-3	Buckeye & Lena group (Union Hill)..........	Gold, silver
C-4	Gold Hill (Gold lode)......................	Do.
C-5	OK lode....................................	Do.
C-6	Sunnyside..................................	Do.
C-7	Antler-Burlington..........................	Do.
C-8	Greenback group............................	Do.
C-9	Mastiff....................................	Copper
C-10	Black Metal group..........................	Tungsten, tin
C-11	J. R. (Cumberland).........................	Gold, silver
C-12	J. R. Extension (Aberdeen Gold Mining & Milling Co.)...........................	Do.
C-13	Tea and Dolcode............................	Do.
C-14	El Dorado..................................	Gold, silver, tungsten, tin
C-15	Sunflower (Battle Axe).....................	Gold, silver
C-16	Golden Slipper.............................	Do.
C-17	Forrest City...............................	Do.
C-18	Halcyon (Joe Dollar).......................	Do.
C-19	Grizzly Bear...............................	Do.
C-20	Golden Summit (Gold Medal).................	Do.
C-21	Clara Belle (Golden Arrow, Forest City)....	Gold, silver, tin
C-22	St. Elmo (Western Belle)...................	Gold, silver
C-23	Cuyahoga...................................	Pyrite
C-24	Spokane....................................	Gold, silver, lead, zinc
C-25	Vulcan (Holy Smoke)........................	Gold, silver
C-26	Black Bird.................................	Tungsten
C-27	Black Crystal..............................	Do.
C-28	Black Diamond..............................	Do.
C-29	Champion property..........................	Tungsten, tin
C-30	Dyke.......................................	Tungsten

Serial No.	Name	Commodity
C-31	Edna Hazel	Tungsten
C-32	Martha Washington	Do.
C-33	Kirka (Downing) claim	Do.
C-34	High (Canfield) lode	Do.
C-35	McKinnon & Miller's claim	Do.
C-36	Elkhorn Tungsten property	Do.
C-37	American Tungsten Mining Co.	Do.
C-38	Reinbold claim	Do.
C-39	Tungsten lode	Do.
C-40	Michigan Placer Ground	Do.
C-41	Pettit & Pfander's claim	Do.
C-42	Wolfram lode	Do.
C-43	Annie No. 1 lode	Tungsten, tin
C-44	Vida May	Tungsten
C-45	White Swan	Do.
C-46	Gira's claim	Do.
C-47	Samelias (Hopeful)	Tin
C-48	Gertie	Do.
C-49	Addie lode	Do.
C-50	Coats Dike	Tin, tungsten
C-51	Blue Bird claim	Tin
C-52	Campaign	Do.
C-53	White Whale group	Do.
C-54	Tenderfoot group	Do.
C-55	Cowboy	Do.
C-56	Mateen or Century	Lithium, tin
C-57	Louise & Hunter	Do.
C-58	Cassiterite	Tin
C-59	Wood Tin	Lithium, beryllium
C-60	Mohawk	Tin
C-61	Carnbray, Snow Shoe, & Tin Belle	Do.
C-62	Excelsior	Do.
C-63	Jolly group	Do.
C-64	Tin Boom	Do.
C-65	Tin Queen (White Blowout)	Lithium, tin, mica, feldspar
C-66	Tin Chance and No. 1	Tin
C-67	Deacon Wright	Do.
C-68	Naiad Queen	Do.
C-69	Sally Cavanaugh	Tin, mica
C-70	Butte (Truax group)	Tin
C-71	Tin King (Tin City)	Do.
C-72	Flora	Do.
C-73	February group	Do.
C-74	Nevada No. 2	Do.
C-75	Tin Plate	Do.
C-76	Olympia	Do.
C-77	First Find	Do.
C-78	Custer group	Do.
C-79	Ida (Ida Tin)	Tin, lithium
C-80	Hardesty Homestead	Beryl, mica, tantalite
C-81	Ingersoll	Lithium, beryl, mica
C-82	Tin Center (Liberty Bell)	Tin
C-83	Ottumwa	Tungsten, tin
C-84	Sarah group	Tin, tantalum

Serial No.	Name	Commodity
C-85	Cheyenne lode	Mica
C-86	Big Smoke	Feldspar, beryl
C-87	Beryl Feldspar mine	Feldspar, mica, beryl
C-88	Big Chief	Do.
C-89	Big Shot	Feldspar, beryl
C-90	Confidence	Feldspar, mica
C-91	Dan Patch	Feldspar, mica, beryl
C-92	Dewey mine	Mica, spodumene, feldspar
C-93	Dike (Dyke)	Feldspar, mica, amblygonite
C-94	Edison mine	Spodumene, mica
C-95	Etta	Spodumene, mica, feldspar
C-96	Eureka	Feldspar, mica
C-97	Ferguson	Feldspar, beryl
C-98	Formoso	Mica
C-99	Gap lode	Mica, feldspar
C-100	Gilt Edge	Mica
C-101	Occidental	Tin
C-102	Henry Tin	Tin, beryl
C-103	High Climb	Feldspar, beryl, mica, amblygonite
C-104	Hugo mine	Feldspar, mica, beryl
C-105	Jumbo lode	Do.
C-106	Josie	Mica
C-107	King Lithia prospect	Lithium, beryl
C-108	King Mica (White Cap) (Primer)	Feldspar, mica, beryl
C-109	Lake (Lakeside)	Mica
C-110	Maderposen	Feldspar, beryl
C-111	Maryland lode (Olds lode)	Feldspar, mica
C-112	Monkey lode	Feldspar, mica, beryl
C-113	New England	Feldspar, beryl
C-114	November mine	Feldspar, mica
C-115	Old Mike (Great Northern)	Mica, beryl
C-116	Oreville Spar	Feldspar, mica
C-117	Juniper mine	Gold, silver
C-118	Peerless	Mica, beryl
C-119	Pink Elephant beryl prospect	Beryl, mica
C-120	Plate mica prospect	Mica, beryl
C-121	Ponca group	Feldspar, mica, beryl
C-122	Put	Beryl
C-123	Queen claim	Beryl, feldspar
C-124	Sitting Bull	Beryl, mica
C-125	Sky lode	Lithium
C-126	Soda Spar (Mountain Lion)	Feldspar, mica, lithium, beryl
C-127	Star lode	Lithium, beryl
C-128	Tiger lode	Lithium
C-129	Watson (Phillip & Phyllis lodes)	Feldspar
C-130	Western Feldspar	Do.
C-131	Noble Mica	Mica
C-132	Old Jeff (Tin Reef)	Tin
C-133	Champion	Feldspar, beryl
C-134	Fern Cliff prospect	Tungsten
C-135	Glendale	Beryl, feldspar, tin
C-136	Old Bill (El Dorado)	Gold, silver
C-137	Grand Junction & Hartford group	Do.

Serial No.	Name	Commodity
C-138	Saginaw (Gold Reserve)	Gold, silver
C-139	Newark group	Do.
C-140	Turk group	Do.
C-141	Golden Crown (Leroy mine)	Do.
C-142	Gold Fish	Do.
C-143	Ross (Highland) mine	Feldspar, beryl
C-144	Bebington group	Gold, silver
C-145	Wild Rose (Grant)	Do.
C-146	Oneota (Mineral Hill)	Do.
C-147	North Star (Hard Scrabble)	Do.
C-148	Western Star	Do.
C-149	Rough Rider (Roosevelt group)	Do.
C-150	Penobscot	Do.
C-151	Echo	Do.
C-152	Lucky Bird	Do.
C-153	Minnie May group	Do.
C-154	Holy Terror mine	Do.
C-155	Keystone mine	Do.
C-156	Bullion mine	Do.
C-157	Columbia (Maiden) mine	Do.
C-158	Lucky Boy	Do.
C-159	Gold Hill lode	Do.
C-160	Egyptian group	Do.
C-161	Nathaniel Pope	Do.
C-162	Bismark-Ida Florence group	Do.
C-163	Legal Tender group	Do.
C-164	Beckman, General Custer, Gold Coin groups	Do.
C-165	Big Hit	Do.
C-166	Eclipse group	Do.
C-167	Grand Island group	Do.
C-168	Heidepriem & Cattles mine	Feldspar
C-169	Sylvanite lode	Do.
C-170	Come Along lode	Do.
C-171	New Deal lode	Do.
C-172	Shamrock No. 1 lode	Do.
C-173	Custer Mountain (Snookum) lode	Feldspar, mica, beryl
C-174	Rambler lode	Feldspar
C-175	Wayside lode (Pinecone)	Feldspar, mica
C-176	Sonny Boy lode	Feldspar
C-177	Tillison's mine	Feldspar, mica
C-178	Lee Burrows' Dike	Feldspar
C-179	Hot Shot mine	Feldspar, mica
C-180	Beck lode	Feldspar
C-181	Tinsley mine (Elkhorn)	Feldspar, mica, beryl
C-182	Mica King mine	Feldspar, mica
C-184	Gira & Ainsley's Dike	Feldspar
C-185	Sunset lode	Do.
C-186	Sunrise lode	Do.
C-187	Forty-Five lode	Do.
C-188	White Spar mine (Westinghouse No. 2)	Mica
C-189	White Dog mica mine	Do.
C-190	Raver & Michaud mine	Feldspar
C-191	Ridge lode	Do.

Serial No.	Name	Commodity
C-192	Dorothy lode	Feldspar, mica
C-193	Dorothy No. 1 lode	Feldspar
C-194	Lucky Spar	Do.
C-195	Big Horn lode	Do.
C-196	Poppy lode	Do.
C-197	OK No. 2 lode	Do.
C-198	E. M. lode	Do.
C-199	A. M. lode	Do.
C-200	Pick lode	Do.
C-201	OK lode	Do.
C-202	IXL lode No. 3	Do.
C-203	OK No. 4 lode	Do.
C-204	Mitchell No. 2 lode	Do.
C-205	Bet lode	Do.
C-206	Ottershagen prospect	Beryl
C-207	Bare Top No. 2 lode	Feldspar
C-208	Bull Moose lode	Do.
C-209	Mitchell No. 1 lode	Do.
C-210	IXL lode	Do.
C-211	IXL No. 4 lode	Do.
C-212	IXL Fraction	Do.
C-213	Saw lode	Do.
C-214	Arcade Nos. 1 & 2 lodes	Mica
C-215	Aladdin mine	Mica, feldspar
C-216	Ballard mine	Mica, beryl, feldspar
C-217	Big Spar No. 1 mine	Feldspar, mica
C-218	Star & Blue Bonnet claims	Mica, beryl
C-219	Mica King No. 3 claim	Mica, feldspar
C-220	Burgess mica prospect	Mica
C-221	Burt mica mine	Do.
C-222	Climax mica mine	Do.
C-223	Custer mica lodes Nos. 1 & 2	Do.
C-224	Phelps (Roosevelt) lode	Feldspar
C-225	Dalmon mica mine	Mica
C-226	Dorothy V prospect	Do.
C-227	Dubuque & Royal Flush claims	Mica, beryl
C-228	Earl lode	Feldspar, mica, beryl
C-229	Highview prospect	Beryl, lithium
C-230	Homestead No. 2 prospect	Mica
C-231	Homestead No. 3 prospect	Do.
C-233	Keystone lode	Do.
C-234	Knowles lode claim	Quartz crystals
C-235	Lost Bonanza mine	Mica
C-236	Lucky Star prospect	Do.
C-237	Wilhelm mine	Feldspar
C-238	Mica Queen No. 1 prospect	Mica
C-239	Mohawk mica (Langford)	Do.
C-240	Surprise mica mine	Do.
C-241	Sunshine mica prospect	Do.
C-242	Terry & Terry No. 1 claims	Do.
C-243	Victory (Hedman) mine	Do.
C-244	Victory No. 1 prospect (Hofert Arcade)	Do.
C-245	Walsh mica prospect	Do.
C-246	Friday lode	Feldspar

Serial No.	Name	Commodity
C-247	Independence No. 1 lode	Feldspar
C-248	Independence lode	Do.
C-249	Tin Mountain mine	Feldspar, lithium, pollucite
C-250	Warren Draw mine	Feldspar, beryl
C-251	Crown mine	Mica, beryl
C-252	Crain	Gold, silver
C-253	Tepee Gulch area	Do.
C-254	Ivanhoe district	Do.

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Bullion mine	C-156
Clara Belle	C-21
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Crain	C-252
Echo	C-151
Eclipse group	C-166
Egyptian group	C-160
El Dorado	C-14
Forrest City	C-17
Gold Fish	C-142
Gold Hill	C-4
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Legal Tender group	C-163
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Lucky Boy	C-158
Minnie May group	C-153
Nathaniel Pope	C-161
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North Star	C-147

Name	Serial No.
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Old Bill	C-136
Oneota	C-146
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Sunflower	C-15
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Tepee Gulch	C-253
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Keystone mine	C-155
Legal Tender group	C-163
Lucky Bird	C-152
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Old Bill	C-136
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Penobscot	C-150
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King Mica	C-108
Maderposen	C-110
Monkey lode	C-112
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Old Mike	C-115
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Pink Elephant beryl prospect	C-119
Plate mica prospect	C-120
Ponca group	C-121
Put	C-122
Queen claim	C-123
Ross mine	C-143
Sitting Bull	C-124
Soda Spar	C-126
Star lode	C-127
Star & Blue Bonnet claims	C-218
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Warren Draw mine	C-250
Wood Tin	C-59

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Name	Serial No.
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IXL lode	C-210
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IXL No. 4 lode	C-211
Jumbo lode	C-105
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Lee Burrow's Dike	C-178
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OK No. 2 lode	C-197
OK No. 4 lode	C-203
Oreville Spar	C-116
Phelps lode	C-224
Pick lode	C-200
Ponca group	C-121
Poppy lode	C-196
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Rambler lode	C-174
Raver & Michaud mine	C-190
Ridge lode	C-191
Ross mine	C-143
Saw lode	C-213
Shamrock No. 1 lode	C-172
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Sonny Boy lode	C-176
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Sylvanite lode	C-169
Tillison's mine	C-177
Tin Mountain mine	C-249
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Warren Draw mine	C-250
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King Lithia prospect	C-107
Louise & Hunter	C-57
Mateen	C-56
Sky lode	C-125
Soda Spar	C-126
Star lode	C-127
Tiger lode	C-128
Tin Mountain mine	C-249
Tin Queen	C-65
Wood Tin	C-59

Mica

Aladdin	C-215
Arcade Nos. 1 & 2 lodes	C-214
Ballard mine	C-216

Name	Serial No.
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Big Spar No. 1 mine	C-217
Burgess Mica prospect	C-220
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Climax mica mine	C-222
Confidence	C-90
Crown mine	C-251
Custer Mica lodes Nos. 1 & 2	C-223
Custer Mountain lode	C-173
Dalmon mica mine	C-225
Dan Patch	C-91
Dewey mine	C-92
Dike (Dyke)	C-93
Dorothy lode	C-192
Dorothy V prospect	C-226
Dubuque and Royal Flush claims	C-227
Earl lode	C-228
Edison mine	C-94
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Eureka	C-96
Formoso	C-98
Gap lode	C-99
Gilt Edge	C-100
Hardesty Homestead	C-80
High Climb	C-103
Homestead No. 2 prospect	C-230
Homestead No. 3 prospect	C-231
Hot Shot mine	C-179
Hugo mine	C-104
Ingersoll	C-81
Josie	C-106
Jumbo lode	C-105
Keystone lode	C-233
King Mica	C-108
Lake	C-109
Lost Bonanza mine	C-235
Lucky Star prospect	C-236
Maryland lode	C-111
Mica King mine	C-182
Mica King No. 3 claim	C-219
Mica Queen No. 1 prospect	C-238
Mohawk Mica	C-239
Monkey lode	C-112
Noble Mica	C-131
November mine	C-114
Old Mike	C-115
Oreville Spar	C-116
Peerless	C-118
Pink Elephant beryl prospect	C-119
Plate mica prospect	C-120
Ponca group	C-121
Sally Cavanaugh	C-69
Sitting Bull	C-124

Name	Serial No.
Soda Spar	C-126
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Sunshine mica prospect	C-241
Surprise mica mine	C-240
Terry & Terry No. 1 claims	C-242
Tillison's mine	C-177
Tin Queen	C-65
Tinsley	C-181
Victory mica mine	C-243
Victory No. 1 prospect	C-244
Walsh mica prospect	C-245
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Tin Mountain mine	C-249

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Spodumene

Dewey mine	C-92
Edison mine	C-94
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Description of Properties

C-1, Blue Lead (Maloney Blue Lead), (Pat. Sur. 1483), Copper,
Hill City District, Pennington County

The Blue Lead group of 23 patented claims is located in sec. 13, T. 1 S., R. 5 E., 1 mile east of Sheridan Lake. It is adjacent to the north edge of the Dakota Calumet group. These groups were consolidated about 1904 as the Continental Copper Co. and are now managed by Bernice Long Rogers, Lake View, N. Y., for the Fred L. Long estate.

Copper was discovered in this vicinity by the Newton-Jenny Survey in 1875, and development apparently began before 1879. Mineralization occurs in a shear zone within a series of graphitic and quartzitic slates, which strike N. 25° W. and dip 60° to 70° northeast. Minerals include pyrite, pyrrhotite, and a little chalcopyrite; the latter has locally altered to azurite, malachite, and native copper.

Workings consisted of several shallow opencuts and a 1,610-foot adit, which intersected the shear zone 1,400 feet from the portal and 300 feet from the surface. The adit is now inaccessible because of caving within 300 feet of the entrance.

The property was operated intermittently from 1879 to 1919. No production figures are available before 1917. Published statistics are:

1917 - 42 tons of ore valued at $987.00
1918 - 580 tons of ore valued at 8,202.81

This material was shipped to the smelter at Omaha.

Ref: 8, pp. 122-123; 12, pp. 208-210; 61, 1891, p. 46; 1894, 1899, 1917, p. 16.

C-2, Dakota Calumet (Continental Copper Co.), Copper,
Hill City District, Pennington County

The Dakota Calumet (Lillian) group consists of 12 patented claims (No. 1497) lying mostly in sec. 19, T. 1 S., R. 6 E. but extending north and is administered by Mrs. Bernice Long Rogers of Lake View, N. Y., for the Fred L. Long estate. In its earlier history it has also been operated as the Black Hills Copper & Milling Co.

Copper was discovered in this area in 1875, and the history, while imperfectly known, parallels that of the adjacent Blue Lead mine. Mineralization consists of pyrite, pyrrhotite, and a trace of chalcopyrite along a shear zone in graphitic schist and quartzite of Algonkian age. This zone, which is 50 to 200 feet wide, strikes N. 25° W., and dips 70° northeast.

Accessible workings include a few small opencuts and one larger excavation about 8 by 10 by 60 feet. A shaft, 850 feet deep, was completed in 1914, and 1,170 feet of drifting was designed to cut the mineralized zone at a depth of 300 feet. A 150-ton matte smelter was operated intermittently on the property between 1907 and 1910. Development continued into 1915.

No production data are recorded.

Ref: 2, p. 187; 12, pp. 209-210; 61, 1914, p. 16.

C-3, Buckeye & Lena Group (Union Hill) (Gopher), Gold, Silver,
Unorganized District, Pennington County

This group consists of 11 patented claims (M. S. 942 and 2024) totaling 144 acres. It is in sec. 12, T. 1 S., R. 4 E., 4-1/2 miles northwest of Hill City.

Mineralization consists of gold-bearing sulfides associated with quartz stringers in fractured schist, slate and quartzite.

The property came into the hands of A. D. Arundel in 1899, and extensive development and mill testing continued through 1900. Ore samples were run through the nearby Sunnyside, J. R., and Clara Belle mills. A mill was apparently built on the Lean group sometime between 1900 and 1903. Early development consisted of 3 shafts, 90, 100, and 175 feet deep, 2 tunnels, 150 and 1,258 feet long, and numerous test pits and trenches.

The property was taken over about 1937 by the Union Hill Gold Mining Co., who did additional development work and rebuilt the old stamp mill. Principal development was driving a new 400-foot adit to intersect the bottom of the 175-foot shaft.

There is no record of the early production. A mill run of 13 tons of ore in 1937 yielded 1.21 ounces of gold.

Ref: 1, p. 82; 2, p. 189; 37, p. 164; 61, 1892.

C-4, Gold Hill (Gold Lode), Gold, Silver, Unorganized District, Pennington County

The Gold Hill group consists of 10 unpatented claims in Burnt Gulch in the SW1/4 sec. 2, T. 1 S., R. 4 E.

The ore lies in a sheared fissure vein in pre-Cambrian schist. According to Lincoln, the fissure, which strikes north-south and dips 80° west, crosscuts the schistosity at 10° to 20°. The vein is 3 to 4 feet wide at the surface and can be traced along the outcrop for 3,000 feet. Mineralization consists of native gold, arsenopyrite, a little pyrite, and traces of galena and copper minerals.

Early development consisted of a 95-foot shaft and numerous trenches and shallow cuts. While under option to Gold Mountain Mining Co. in 1938-40, a new 170-foot, 2-compartment shaft was put down, with some drifting at the 90-foot level. A 25-ton mill produced concentrate for shipment to a smelter. The mill was expanded to 75 tons during development work. There has been no activity since 1940; the shaft was filled with water and the mill was partly dismantled when visited in 1950.

Except for a small amount of gold produced during development in 1940, there is no record of the gold produced from the Gold Hill property.

Ref: 1, pp. 82-85; 37, pp. 139-140.

C-5, OK Lode, Gold, Silver, Hill City District, Pennington County

The OK group consists of 3 unpatented claims centering in the SE-1/4 of sec. 2, T. 1 S., R. 4 E. 4 miles northwest of Hill City.

The property is said to lie on a southeastern extension of the same fissure vein as the Gold Hill mine. The shear zone is 3 to 4 feet in width, strikes N. 40° W., and dips 70° southwest.

Early history is not known. Development consists of 3 shafts, 20, 70, and 135 feet in depth, and about 320 square feet of opencuts along the shear zone. Development is recorded for 1923-29.

Production records are not in agreement. Lincoln recorded 100 tons netting $771 in 1923, and 90 tons valued at $938.60 in 1924. Allsman reported that 140 tons in 1924 yielded 41.12 ounces of gold and 6 ounces of silver.

Ref: 1, p. 86.

C-6, Sunnyside (M. S. 1080), Gold, Silver, Unorganized District, Pennington County

The Sunnyside group consists of three patented claims. They are on the north side of Newton's Fork in the SW-1/4 sec. 12, T. 1 S., R. 4 E. 2 miles northwest of Hill City.

The ore deposit is a quartz vein in pre-Cambrian schist. It has a strike of N. 35° W. and dips 60° southwest. The ore shoot, which was completely mined out to a depth of 350 feet, had a length of 60 to 70 feet and a width of up to 2-1/2 feet.

Early history is incomplete. The available information comes from scattered news items in the Black Hills Industrial Review during 1896, 1898, and 1899. There was activity on the property as early as 1895; a 5-stamp mill operated 1896-98, and the work was apparently abandoned in 1899. An inclined shaft following the vein reached a depth of 450 feet before water caused the shaft to be abandoned. The shaft is now caved, and all buildings are gone from the site.

Production figures are limited to 1897, when the Inspector of Mines' report showed $25,000 recovered from 1,200 tons of ore. Allsman estimated this to represent one-third of the total production.

Ref: 1, pp. 81-82; 61, 1897, p. 29.

C-7, Antler-Burlington, Gold, Silver,
Unorganized District, Pennington County

The Antler group, consisting of 2 claims and a millsite on Newton's Fork, lies in the SE1/4 sec. 13, T. 1 S., R. 4 E. 3 miles northwest of Hill City. It comprises approximately 45 acres.

The ore lies in a shear zone within pre-Cambrian schists. Two shafts 40 and 70 feet in depth and about 220 feet of lateral workings comprise the development work.

Early history of the prospect is unknown. It was apparently operated around 1905 by the Burlington Gold Mining Co., in conjunction with their Burlington mine near the head of Burnt Fork Gulch. The Antlers Co. was organized in 1916 and is reported to have shipped some ore to a smelter. It was apparently operated also for awhile by the Burnt Fork Mining Co., which held several of the properties in Burnt Fork Gulch just north of the Antlers property. Some development was undertaken in the late 1930's under the name of the Central Black Hills Gold Mine.

Ref: 37, pp. 123, 129; 61, 1916, p. 16.

C-8, Greenback Group, Gold, Silver,
Unorganized District, Pennington County

The Greenback group consists of 3 unpatented claims totaling approximately 20 acres. It is in the SE1/4 sec. 13, T. 1 S., R. 4 E in a small, south-flowing tributary of Newton's Fork 2 miles north of Hill City. In 1937, the claims were held by location by Fred and Harry Mills of Hill City, S. Dak.

The deposit is reported by Lincoln to be a fissure vein in pre-Cambrian schists and slates. The only development, consisting of a 20- and a 60-foot shaft and several small opencuts, was done during the early days of mining in the area.

There has been no recorded production from the group.

Ref: 37, p. 141.

C-9, Mastiff (M. S. 2032), Copper,
Unorganized District, Pennington County

The Mastiff group consists of 2 patented claims totaling approximately 40 acres in the northeast corner of sec. 27, T. 1 S., R. 3 E.

The Mastiff lies at the south end of a northwest-trending belt of early-day copper prospects, which have received attention far beyond their economic importance. A few, notably the Dakota Calumet group near Hill City, the Black Hills Copper Co. west of Rochford, and the Custer Peake Copper Co. south of Lead, were extensively developed before it was recognized that the tin zone of secondary copper minerals noted by the prospectors gives way within a few feet to pyrite carrying only an exceedingly small percentage of chalcopyrite.

The Mastiff is one of a dozen or so minor prospects, on which virtually no work has been done, which have been repeatedly mentioned in the literature even though they have not been seriously considered as copper prospects for over 50 years.

Ref: 12, p. 211; 45, p. 54.

C-10, Black Metal Group, (M. S. 1986), Tungsten, Tin, Hill City District, Pennington County

The Black Metal group consists of 9 patented claims totaling approximately 180 acres in China Gulch 1 mile northeast of Hill City. It lies in secs. 19 and 20, T. 1 S., R. 5 E. Pennington County.

Quartz veins 4 to 12 inches in width, cut pre-Cambrian mica schist. Ore minerals are wolframite, scheelite, and cassiterite; gangue minerals include pyrite, mica, and tourmaline.

Most of the development was done before 1909. A vertical, east-west vein has been developed on the Black Metal No. 3 lode by 60 feet of trenching and a 47-foot shaft. Another vein on the same claim is 6 to 8 inches in width, strikes N. 23° W., and dips steeply northeast. A 65-foot vertical shaft with 30 feet of drifting to the north and a similar distance to the south from its base exposes a 6- to 8-inch vertical vein on the Black Metal No. 6 lode. Two test pits on the Black Metal No. 5 reveal a 9- to 12-inch vein, which strikes N. 50°-55° E. and dips 45° northwest. Assessment pits and exploratory trenches expose lesser veins on the other claims within the group.

No production has been recorded.

Ref: 12, p. 202; 13, p. 24; 14, pp. 24-25; 32, pp. 150-152; 37, pp. 127; 52, pp. 59-61.

C-11, J. R. (Cumberland) (M. S. 1160, 1860), Gold, Silver, Unorganized District, Pennington County

The J. R. group consists of six and a fraction claims in the NE1/4 sec. 21, T. 1 S., R. 5 E. About 50 acres are patented. This area, 3-1/2 miles northeast of Hill City, was originally called the Dogtown and later the Cross mining district.

The ore body is a fissure vein that cuts pre-Cambrian schist. It can be traced on the surface for several hundred feet and has an average width of 4 feet. It strikes essentially north-south and dips 40° west.

Development has been by opencuts, an old 300-foot inclined shaft, a newer 370-foot shaft, and some stoping and crosscutting.

Original operation of the mine was from 1892-94. A 20-ton stamp mill was built in 1892. After a period of inactivity the Cumberland Mining & Milling Co. was formed in 1902 and operated intermittently until 1906. Remains of an old 10-stamp mill are on the property. In 1939 the mine was unwatered and examined by the Runyan Mining Co. Workings are now inaccessible.

The only production figures available are as follows:

	Tons			
1892.....	10,000	$50,000		
1893.....	6,720	94,000		
1894.....	7,200	79,200		
1899.....	-	6,000		
1908.....	145		39.96 oz. gold	34 oz. silver

Ref: 1, pp. 80-81; 45, 1892, pp. 7, 94; 1939, p. 23; Black Hills Ind. Rev., October 1906.

C-12, J. R. Extension (Aberdeen Gold Mining & Milling Co.)
(M. S. 1864), Gold, Silver,
Hill City District, Pennington County

This group comprises 5 patented and 1 unpatented claims adjoining the old J. R. group on the south. The total acreage consists of approximately 70 acres patented and 15 acres unpatented.

The ore body follows a quartz vein cutting pre-Cambrian schist and quartzite, which is presumably an extension of the J. R. ore body. The vein is 1-1/2 to 2 feet in width.

Development consists of 2 vertical shafts about 75 feet deep, and some trenching across the outcrop of the vein.

Early history is not known. The Aberdeen Gold Mining & Milling Co. apparently did most of the development work around 1904.

No production has been recorded from the property.

Ref: 1, p. 81; 2, p. 187; 37, p. 130.

C-13, Tea (M. S. 1572) and Dolcode (Dolcoad, Dol Coad) (M. S. 1315), Gold, Silver,
Hill City District, Pennington County

The Tea and Dolcode each consists of three patented claims. The group of 6 claims, totaling approximately 58 acres, lies in the E-1/2 sec. 28, T. 1 S., R 5 E. about 3 miles east of Hill City.

The ore body is reported to lie within a fissure vein, which cuts across the pre-Cambrian schists. Lincoln reports the following development to have been done before 1895: 2 shafts, 80 and 155 feet in depth; 210 feet of tunneling. The Dolcode was apparently operated as late as 1899, but, except for very limited development in 1935, it has remained idle since that date.

The property was under lease to New El Dorado Mines, Inc., in the late 1930's.

Ref: 37, p. 133; 61, 1899.

C-14, El Dorado (M. S. 2014), Gold, Silver, Tungsten, Tin, Unorganized District, Pennington County

The El Dorado groups consist of 3 patented claims, the El Dorado, Gold, Dust and Midway fraction, which total 35 acres. They are on the line between secs. 27 and 28, T. 1 S., R. 5 E. about 3 airline miles east of Hill City.

Ore shoots occupy a narrow, nearly vertical shear zone striking east-west through pre-Cambrian schist and slate. Individual ore shoots were from 20 to 30 feet in length, 2-1/2 to 3 feet in width, and of undetermined depth.

Development consists of an abandoned 200-foot shaft dating back to the late 1890's and an 85-foot shaft with 450 feet of drifting on the 80-foot level. The latter work was done by the New El Dorado Mines, Inc., who acquired the property along with six adjacent unpatented claims in 1936. A 35-ton amalgamation mill was built and operated in 1937-38, and in 1939 it was remodeled to do custom milling of tungsten ores.

Production records indicate four small mill runs in 1897-98. There was apparently also a small production in 1899, which was not reported. The following values are in gold at $20 an ounce.

	Tons	
1897.....	50	$1,000
1898.....	30	522
	30	450
	200	2,000

Ref: 1, pp. 73-74; 37, p. 152; 65, p. 513.

C-15, Sunflower (Battle Axe) (M. S. 1926), Gold, Silver, Unorganized District, Pennington County

The Sunflower or Battle Axe group consists of 4 patented claims totaling 80.64 acres in the N1/2 sec. 28, T. 1 S., R. 4 E. 5 miles west of Hill City. The property lies at an elevation of about 6,000 feet.

About 1902 the Sunflower Mining & Milling Co. was organized. According to news stories in the Black Hills Mining Review, in 1903 the company acquired a total of eight claims, including the original four of the Sunflower group, and did intermittent development work until about 1904.

The ore body is reported to follow a fissure in the pre-Cambrian schists. Gold and some silver are associated with sulfides, primarily arsenopyrite.

Development consisted of a 300-foot tunnel and shafts 15, 20, and 85 feet in depth. The shafts were reportedly put down before 1885 and the tunnel around 1904.

There is no record of a mill or of any production from the property.

Ref: 2, p. 185; 37, p. 161.

C-16, Golden Slipper, Gold, Silver, Unorganized District, Pennington County

The Golden Slipper mine lies in the NE1/4 sec. 26, T. 1 S., R. 5 E. about 6 miles east of Hill City. The Slipper group, together with the adjacent Forrest City group, totaling about 900 acres, was operated in 1934-40 as a unit by Empire Gold Mines, Inc.

The Golden Slipper ore body, discovered in 1893, consists of a quartz vein about 10 inches thick, striking N. 30° W., and dipping 70° southwest. Ore shoots within the vein have been traced to a depth of 650 feet. Gold occurs free and with arsenopyrite and other sulfides.

Development consists of an inclined shaft in the plane of the vein, with crosscuts on the 60- , 120- , 250- , 310- , 355- , 420- , 500- , and 550-foot levels. A 650-foot level is reached from a winze below the 550-foot level, located about 300 feet southeast of the foot of the main shaft. Extensive stoping has been done between levels in the ore shoots. The Slipper workings are connected to the nearby Forrest City workings at the 550-foot level.

Production may be summarized as follows:

1893-99		Ore milled from above 290-foot level	$46,000	
1900...		Ore milled from above 462-foot level	9,000 from 250 tons	
1911...	71	tons ore yielded	231.89 oz. au	44 oz. ag
1935...	600	tons ore yielded	295.86 oz. au	52 oz. ag
1936...	237	tons ore yielded	119.15 oz. au	24 oz. ag
1937	17,500	tons ore yielded	1,642.15 oz. au	266 oz. ag

Production in 1935-38 includes ore from both the Golden Slipper and Forrest City veins.

Ref: 1, pp. 74-79; 2, p. 183; 17, p. 27; 37, p. 183.

C-17, Forrest City, Gold, Silver,
Keystone District, Pennington County

The Forrest City lode lies immediately south of the Golden Slipper mine, in the NE1/4 of sec. 26, T. 1 S., R. 5 E. The ore body seems to have been discovered in 1911. Ore occurs as shoots along a quartz vein, which strikes N. 35° W. and dips 55° to 60° southwest. It is south of, and essentially parallel to, the Golden Slipper vein.

Development consists of a shaft that is vertical for 46 feet and inclined in the plane of the vein for an additional 120 feet. Levels are developed at 60, 100, and 165 feet. The 550-foot level of the Golden Slipper workings cut the ore body at that depth, and the 650- and 750-foot levels are connected to the 550-foot level by an inclined winze. The development below 165 feet was evidently done by raising from the Golden Slipper 550-foot level subsequent to 1934.

Production records for the early operation are not available. No effort was made by Empire Gold Mines, Inc. (1934-40), to separate production from the Golden Slipper and Forrest City veins; all production during that interval has been credited to the Golden Slipper.

Ref: 1, pp. 74-79; 17, p. 27; 37, p. 138.

C-18, Halcyon (Joe Dollar), Gold, Silver, Hill City District, Pennington County

The Joe Dollar group consists of 11 unpatented claims. They lie in sec. 23, T. 1 S., R. 5 E about 5 miles northeast of Hill City.

Ore is reported to be associated with a quartz vein and also with a faulted shear zone. Both are reported to carry gold on the outcrop. Except for 2 shafts 32 and 40 feet deep, all exploration and development work has been by tunneling. A 2,350-foot adit, plus about 700 feet of crosscutting, has been driven. The shear zone has been followed for 300 feet, but the quartz vein has not been located in depth.

Early history is incomplete. In 1907 the Black Hills-Anaconda Co. was driving an exploratory tunnel 150 feet into the hillside.

The Halcyon Mining Co., organized in South Dakota in 1912, performed intermittent development work for many years and was active as late as 1938. Much of the exploratory drifting was done in 1936-38. A 10-stamp mill was reported on the property in 1937.

Ref: 1, pp. 79-80; 37, p. 142.

C-19, Grizzly Bear, Gold, Silver, Unorganized District, Pennington County

The Grizzly Bear mine is located 5 miles southeast of Hill City in the NE1/4 sec. 18, T. 2 S., R. 5 E.

The Grizzly Bear was apparently one of the earliest gold-mining properties in the area, but details of early history are lacking. It was worked under lease as late as 1897. In 1902, the Dakota Gold Mining & Milling Co. acquired 292 acres of mining ground, including the old Grizzly Bear mine. All but 100 acres of this was patented. A 1904 report indicates a total of 2,200 feet of development, itemized as including 24 shafts, 15 cuts, 6 tunnels, and 4 drifts.

Gold occurred in veins trending northeast-southwest and dipping about 45°. Width of the main vein is reported as varying from 3 to 30 feet.

Two mills, a 5- and a 20-stamp operation, were reported on the property before 1904. An unofficial yield of $200,000 in gold is reported.

Ref: 2, p. 177; 61, 1902, p. 22.

C-20, Golden Summit (Gold Medal), Gold, Silver, Hill City District, Pennington County

The Golden Summit group consists of 5 patented claims totaling 50 acres (M. S. 419-421; 980-981). It is located in sec. 33, T. 1 S., R. 5 E. about 2-1/2 miles southeast of Hill City.

Free gold occurs in a quartz vein that cuts biotite schist. The vein strikes essentially east-west and dips 45° to the south. With depth the ore body becomes involved in folding associated with a northwest-trending syncline.

Development consisted of a 300-foot shaft, which passed out of ore at 200 feet. A winze, inclined to the horizontal at 30°, followed the ore body from the 130- to the 500-foot level. A 500-foot crosscut, driven southwest from the foot of the shaft, and a 400-foot crosscut, driven northeast from the same point, both failed to encounter the vein.

The mine was developed intermittently from 1878 to 1913. The only production by the Gold Medal Mining Co. is listed below. There was some exploratory work in 1927-28. Remains of the 20-ton steam-operated mill are on the property.

Production

Year	Ore, tons	Gold, oz.	Silver, oz.
1909...	140	333.16	39
1912...	200	82.42	17
1913...	-	30.85	6

Ref: 1, pp. 72-73; 2, p. 174; 17, p. 27; 37, p. 139.

C-21, Clara Belle (Golden Arrow, Forest City), Gold, Silver, Tin, Unorganized District, Pennington County

The Clara Belle group consists of 13 unpatented claims, centering in the NE1/4 sec. 23, T. 2 S., R. 4 E. but extending into adjacent parts of secs. 13, 14, and 24.

The property was originally discovered by Frank Hebert in 1886. In the following 15 years an incline was driven down the ore body for approximately 200 feet, and a 2-stamp mill was in intermittent use. In 1901 the Clara Belle Gold Mining Co. was formed. A new, vertical shaft 270 feet deep was sunk, and a 350-foot crosscut was driven on the 250-foot level to reach the vein. A 97-foot winze followed down on the vein.

The ore lies in a quartz vein, which strikes northeast and dips about 45° to the northwest. The vein is reported to have varied between 6 and 16 feet in thickness, with the highest gold values along the hanging wall.

During development, a 2-inch to 2-foot tin-bearing pegmatite was encountered about 75 feet northwest of the gold vein. The tin occurs in segregations of granular mica and tourmaline with a little quartz.

Production records cited by Allsman indicate an unverified production of about $500 in gold before 1901, and a total yield between 1902 and 1914 of 1,514.81 oz. gold and 130 oz. silver.

Ref: 1, pp. 71-72; 2, p. 184; 25, pp. 45-46, 32, pp. 140-141; 37, pp. 138-139; 61, 1904, p. 24.

C-22, St. Elmo (Western Belle), Gold, Silver, Unorganized District, Pennington County

The Western Belle, or St. Elmo group, consists of 3 unpatented claims centering in the NW1/4 sec. 24, T. 2 S., R. 4 E. about 5 miles south of Hill City.

Early history is lacking. Considerable mining had been done, the ore being put through a 10-stamp mill, before 1900. A new shaft was sunk to a depth of 208 feet vertically by the Grantz Gold Mining Co., who acquired the property about 1902. After many years of idleness, the property was operated in a small way in 1937-38.

The ore body at the St. Elmo consists of one principal quartz vein and several smaller stringers. The main vein strikes N. 80° E. at the surface. It is reported to be a continuation of the ore-bearing vein on the adjacent Clara Belle property. The principal vein splits about 100 feet below the surface. The main quartz mass extends nearly vertically to the surface; the smaller offshoot approaches the surface at a low angle.

Principal development consists of an inclined shaft, with about 200 feet of drifting and crosscutting along the level where the veins split. Irregular stoping has followed the high-grade ore bodies.

Production records are scattered. An early report gives a yield in 1896 of $3,708.35 from 306 tons of ore. Allsman adds a total of 159.15 ounces of gold and 11 ounces of silver recovered from 1,820 tons of quartz between 1903 and 1937.

Ref: 1, pp. 69-71; 2, p. 195; 37, p. 165; 61, 1897, p. 28; 1902, pp. 23-24.

C-23, Cuyahoga, Pyrite,
Unorganized District, Custer-Pennington Counties

The Cuyahoga mine lies on a group of claims that lie astride the Custer-Pennington County line in secs. 20, 21, 28, and 29, T. 2 S., R. 6 E. on the southeast flank of Iron Mountain. The mine and the nearby Spokane property are both held by the Iron Mountain Development Co., with offices at Cleveland, Ohio.

The pre-Cambrian rocks in the area strike northeast-southwest and dip about 45° to the southeast. Development consists of a 1,000-foot exploratory tunnel driven northwest across the strike of the beds. Two hundred forty feet from the portal a shaft extends 100 feet to the surface and also to a depth of 200 feet below the main level. A short drift extends southeast from the 100-foot level, and a station has been cut at the 200-foot level.

Mica, schist, quartzite, and soft black graphitic slate were the principal rocks encountered in driving the drift. Tin was reported in the drift and also in a 1,100-foot inclined drill hole drilled in 1909. The collar is reported to have been about 150 feet southeast of the adit, and the hole extended downward at 60° in a northwest direction.

Pyrite, from the graphitic zone, was mined and shipped to Cleveland, Ohio, in 1916. There has been no activity at the property since about 1917. The buildings have all been removed, and only the brickwork shows the location of the powerhouse and blacksmith shop. Workings are accessible except for a cave 290 feet from the portal.

Ref: 2, pp. 196-197; 37, p. 81; 61, 1916, p. 18.

C-24, Spokane, Gold, Silver, Lead, Zinc,
Unorganized District, Custer County

The Spokane mine is in the southwest corner of sec. 26, T. 2 S., R. 6 E. The group comprises 15 claims held by the Iron Mountain Development Co. of Cleveland, Ohio. It covers 100 acres in secs. 26, 27, and 35.

The ore body is a fissure vein, which strikes east-west and dips north at 70°. It is conformable with the enclosing schist, except where it cuts a small pegmatite.

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It varies in thickness from a few inches to over 25 feet and may be traced on the surface for 723 feet. Ore minerals are galena, sphalerite (marmatite), and a little chalcopyrite. Gangue minerals are quartz and pyrite. Silver and part of the gold are associated with the galena; some of the gold is apparently associated with pyrite.

Three ore shoots have been found. The main or central shoot has been developed by an inclined shaft, with drifts on the 60- , 100- , 200- , and 300-foot levels. An ore shoot was discovered on the 200-foot level 436 feet east of the shaft. It has been explored by a 41-foot raise and a 50-foot winze. A small, undeveloped ore shoot crops out on the surface 160 feet west of the shaft.

The property has changed hands many times. The first records indicate that the shaft was down 120 feet by 1891. Two carloads of ore, valued at $23 per ton were shipped in 1898 by the Crown Point Mining Co. In 1899, 23 additional cars were shipped. The Spokane Lead & Silver Co. shipped several carloads of concentrates in 1917-19. The Spokane Silver & Lead Co. produced 297 tons of concentrates valued at $8,586.07 (net smelter returns) from 9,000 tons of ore in 1927. The Iron Mountain Development Co. shipped 122 tons of broken ore to the Helena smelter in 1940. There has been no activity since that date.

Ref: 12, pp. 183-185; 37, p. 81; 61, 1891, pp. 52-53; 1916, p. 18.

C-25, Vulcan (Holy Smoke), Gold, Silver,
Keystone District, Pennington County

The Vulcan or Holy Smoke group consists of 102 acres of patented ground (M. S. 1525) centering on the corner common to secs. 31 and 32, T. 1 S., R. 6 E. and secs. 5 and 6, T. 2 S., R. 6 E. It lies on U. S. Highway 16 about 1 airline mile northwest of Keystone.

The ore body apparently consists of mineralization along a shear zone within the pre-Cambrian schist and quartzite.

Development, all of which was done before 1900 by the Vulcan Mining & Milling Co., consists of 2 shafts 85 and 106 feet in depth. Some crosscutting is reported from the bottom of the deeper shaft, and there are numerous small trenches and test pits on the property.

There is no recorded production, though some ore may have been treated at a custom mill at Keystone in the period of development.

Ref: 2, pp. 178-179.

C-26, Black Bird, Tungsten,
Unorganized District, Pennington County

The Black Bird lode consists of 1 unpatented claim of 20 acres in the center of the W1/2 sec. 3, T. 2 S., R. 5 E. about 4-1/2 miles southeast of Hill City. It was formerly owned by Canfield, Hicks, and Roush.

The ore body consists of a quartz vein cutting pre-Cambrian schist. The ore mineral, which is wolframite, occurs in small masses irregularly disseminated throughout the quartz. The vein strikes N. 45° W. and is essentially vertical.

Development consists of a 75-foot trench extending along the strike of the vein and a 40-foot shaft in the vein, now inaccessible.

This is a prospect only, with no recorded production.

Ref: 12, p. 201; 14, p. 24; 37, p. 125; 52, p. 54.

C-27, Black Crystal, Tungsten, Unorganized District, Pennington County

The Black Crystal property consists of 1 unpatented claim of approximately 20 acres in the center of sec. 10, T. 1 S., R. 5 E. about 5 miles northeast of Hill City. It is held by G. H. and Bert Hardesty of Keystone, S. Dak.

The ore body consists of a quartz vein cutting pre-Cambrian schist and slate. The vein carries wolframite in small irregular masses.

Development consists of a prospect trench 7 feet deep, extending along the strike of the vein for about 30 feet; a 60-foot shaft in the vein; and some drifting and crosscutting from the shaft.

The property has been idle since 1916.

Production is given by Lincoln as consisting of $425 worth of tungsten ore produced in 1915.

Ref: 14, p. 24; 37, p. 125.

C-28, Black Diamond, Tungsten, Unorganized District, Pennington County

The Black Diamond property consists of 1 unpatented claim of approximately 20 acres on Spring Creek on the north line of sec. 32, T. 2 S., R. 4 E. 7 miles northwest of Custer.

The ore body consists of a quartz vein cutting pre-Cambrian schist. According to Thomas, who visited the property in 1888, the vein is 6 to 7 feet in thickness and dips steeply to the north. Wolframite is disseminated in small masses throughout the quartz and muscovite.

Development consists of a series of small prospect trenches and test pits extending along the strike of the vein for 150 feet. The largest pit is approximately 15 feet deep.

This is a prospect only, with no recorded production.

Ref: 14, p. 24; 37, p. 125; 65, p. 513.

C-29, Champion Property, Tungsten, Tin, Hill City District, Pennington County

The Champion property consists of 1 unpatented claim of approximately 20 acres in the SE1/4 sec. 27, T. 1 S., R. 5 E. about 4-1/2 miles southeast of Hill City. It was formerly owned by Pennington and Smith.

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The ore body consists of a coarse, high-quartz pegmatite dike, 3 to 6 feet in thickness, with occasional narrow schist inclusions. Wolframite and a little cassiterite occur in a gangue of quartz, mica, feldspar, and tourmaline. The dike strikes northeast, dips 45° northwest, and has a length of 700 to 800 feet. It dips more steeply than the schist but has the same strike. Toward the south end the two become conformable. Gardner reports that development consists of 5 or 6 old cuts and a 10-foot inclined shaft.

On the south end of the claim a quartz vein, 1 to 2 feet in thickness, has yielded good crystals of wolframite. It has been opened up only by a single 15-foot prospect hole.

The Champion lode is a prospect only; no production has been recorded.

Ref: 14, p. 25; 25, p. 39; 37, p. 129; 52, p. 58.

C-30, Dyke, Tungsten,
Hill City District, Pennington County

The Dyke claim consists of 1 unpatented claim of approximately 20 acres, formerly owned by the Harney Peak Tin Mining, Milling & Manufacturing Co. It lies 1/2 mile east of Hill City in the southwest corner of sec. 29, T. 1 S., R. 5 E. It is not to be confused with the Dike pegmatite located 3 miles southeast of Keystone.

Black tungsten minerals occur in a thick pegmatite dike containing quartz, feldspar, muscovite, tourmaline, and graphite. The dike strikes N. 50° W. and dips steeply to the southwest.

It has been developed by prospect holes and a small shaft and may be traced along the strike for approximately 350 feet.

The Dyke is a prospect only with no recorded production.

Ref: 14, p. 25; 37, p. 134; 52, pp. 58-59.

C-31, Edna Hazel, Tungsten,
Unorganized District, Pennington County

The Edna Hazel tungsten prospect consists of one 20-acre, unpatented claim near the center of sec. 26, T. 1 S., R. 5 E. 4-1/2 miles east of Hill City.

A vein of clear, glassy quartz cuts the pre-Cambrian schist, and strikes N. 20° W. It is nearly vertical and varies from a few inches to 2 feet in width. It contains crystals of wolframite up to 2 inches in length and is said to be very rich in local areas within the vein. An analysis of one of the wolframite crystals by M. L. Hartman, professor of chemistry at the South Dakota School of Mines indicates a composition of 69.7 percent $FeWO_4$ and 30.7 percent $MnWO_4$.

This is a prospect only, and no production has been recorded.

Ref: 14, p. 25; 37, pp. 134-135; 52, p. 58.

C-32, Martha Washington, Tungsten, Unorganized District, Pennington County

The Martha Washington (C. H. Kammon) lode consists of 1 unpatented claim of approximately 20 acres 4-1/2 miles east of Hill City in the NE1/4 sec. 3, T. 2 S., R. 5 E.

The ore bodies consist of quartz-muscovite veins carrying wolframite. The largest vein on the property strikes N. 65° E. and dips at a low angle to the southeast. It cuts the schist discordantly, but toward the south end small stringers of quartz extend for short distances into the schist. The main vein has been opened up by a trench extending 100 feet along its strike.

A second vein, southwest of the one just described, has a variable northwest to west strike and also dips southward at a low angle. It is 6 to 12 inches in thickness, and shows but little wolframite on the outcrop. It has been exposed for a distance of 25 feet by a prospect cut.

These are prospects with no recorded production.

Ref: 14, p. 27; 37, p. 149; 52, p. 54.

C-33, Kirka (Downing) Claim, Tungsten, Unorganized District, Custer County

This property consists of 1 unpatented claim totaling approximately 20 acres. It is located in the SW1/4 sec. 28, T. 2 S., R. 4 E. 7 miles southwest of Hill City.

The deposit consists of a quartz vein, which strikes N. 60° W. and dips steeply to the southwest. The vein pinches and swells and has a maximum recorded width of 14 inches. Tungsten minerals are associated with pyrite, muscovite, and biotite within the quartz.

Development consists of a prospect trench, which extends along the strike of the vein for about 50 feet and reaches a maximum depth of 15 feet.

A pegmatite dike on the same claim is reported to carry some wolframite. Prospecting and mining on this property was done in 1916-18. There was some unrecorded production from the claim in 1918.

Ref: 14, p. 27; 37, p. 73; 52, p. 51; 61, 1916.

C-34, High (Canfield) Lode, Tungsten, Unorganized District, Pennington County

The High (Canfield) lode consists of 1 unpatented claim of approximately 20 acres. It lies on the northeast flank of Summit Peak along the west line of the SW1/4 sec. 33, T. 1 S., R. 5 E. 2-1/2 miles southeast of Hill City.

Wolframite occurs in 4 quartz veins, each 1 to 12 inches in width, which cut a pegmatite composed of quartz, feldspar, and muscovite.

Development has been confined to a series of opencuts and test pits.

This is a prospect only, with no known production.

Ref: 14, p. 27; 37, p. 143; 52, p. 53.

C-35, McKinnon and Miller's Claim, Tungsten, Unorganized District, Pennington County

This property consists of 1 unpatented claim of approximately 20 acres. It is located in the SE1/4 sec. 8, T. 2 S., R. 5 E about 4-1/2 miles southeast of Hill City.

Wolframite occurs as small segregations in a pegmatite dike. The dike, which varies from 1 to 3 feet in thickness, strikes essentially north-south and dips 75° west. Pegmatite minerals are quartz, feldspar, muscovite, garnet, and tourmaline. The wolframite is associated with the quartz and garnet. An analysis of the wolframite shows 71.4 percent $FeWO_4$ and 28.6 percent $MnWO_4$.

The dike has been opened up by numerous small test pits scattered along the strike for 200 feet. Wolframite appears to be more abundant near the north end of the dike.

A second dike, parallel to the first, lies about 100 feet to the west. It is reported to be thinner but relatively richer than the main pegmatite.

This claim is a prospect only with no recorded production.

Ref: 14, p. 28; 37, p. 150; 52, p. 52.

C-36, Elkhorn Tungsten Property, Tungsten, Hill City District, Pennington County

The Elkhorn property consists of 3 unpatented claims totaling about 60 acres. It is in the SE1/4 sec. 34, T. 1 S., R. 5 E. about 4-1/2 miles southeast of Hill City. The property has also been known as the Black Hills Tungsten Mining & Milling Co. property, and as the Heart of the Black Hills property.

Five tungsten-bearing quartz veins on the property strike northwest and dip southwest. They cut garnet-bearing mica schist of pre-Cambrian age. The westernmost vein, apparently lens-shaped, was largely mined out from an inclined shaft. One or more irregular veins crop out near the old power house 100 feet to the east. A 1-foot vein, containing muscovite, graphite, and wolframite, is exposed by a 50-foot opencut along the strike and by a 40-foot inclined shaft. A third, 75 feet northwest of the second, averages about 24 inches thick. It has been developed by an inclined shaft, with extensive drifting, crosscutting, and raising at the 90-foot level. Two other veins have been explored by prospect cuts and pits.

Production

1913...	$3,000 from 200 tons of ore
1914...	400 from undetermined tonnage of ore
1916...	10,000 from 5 tons of concentrates, idle since 1918

Ref: 14, pp. 10-11, 14, 26-27; 37, p. 142; 52, pp. 54-56.

C-37, American Tungsten Mining Co., Tungsten, Unorganized District, Pennington County

The properties of the old American Tungsten Co., also known as the Good Luck property, lie in the SW1/4 sec. 27 and the NW1/4 sec. 34, T. 1 S., R. 5 E. The group consists of 4 patented and 4 unpatented claims, totaling 148 acres.

On the Success claim a quartz vein 8 to 18 inches in width strikes N. 45° W. and dips steeply to the northeast. It cuts graphitic schist and shows a concentration of muscovite along the contacts. Wolframite occurs in bladed crystals up to 2-1/2 inches long. The vein has been developed by opencuts for 75 feet along the strike and by a 25-foot shaft.

On the Good Luck claim, wolframite, ferberite, and scheelite occur in a 2-foot quartz vein cutting graphitic mica schist. The vein strikes N. 30° W., and the dip averages 60° southwest. Development consists of a 100-foot shaft, with 97 feet of drifting, an 18-foot raise to the surface, a 30-foot inclined winze on the 40-foot level, and a 28-foot crosscut at the bottom of the shaft.

An 8-inch vein on the Cleveland lode strikes N. 30° W. and dips steeply northeast. A series of prospect pits, exposing the vein for 40 feet, show glassy quartz carrying wolframite crystals up to 2-1/2 inches long and a minor amount of muscovite.

The American Tungsten Mining Co., organized in 1907, did most of the development outlined above, built a 10-stamp concentrating mill, and produced a small quantity of concentrates within that year. Except for a period when the mine was cleaned and the mill reconditioned about 1937 by Arthur Wabel of Hill City, the property has been idle since 1907.

Ref: 8, p. 141; 14, pp. 10, 26; 32, p. 152; 37, pp. 140-141; 52, pp. 56-58; 68, p. 220.

C-38, Reinbold Claim, Tungsten,
Hill City District, Pennington County

The Reinbold Metallurgical Corp. of Omaha formerly owned a single, 20-acre claim 5 miles south of Hill City. It is located in Sunday Gulch in the northeast corner sec. 13, T. 2 S., R. 4 E.

A mineralized zone, up to 5 feet in width, cuts across the property N. 35° W. and dips steeply to the southwest. Within the zone the schists have been intruded by small kidneys, lenses, and veinlets of pegmatite. According to Runner, the huebnerite and scheelite ores are concentrated along the contacts between the pegmatite and schist, as well as within the pegmatite and within seams in the schist. Pegmatite minerals include quartz, biotite, muscovite, feldspar, and tourmaline.

A small quartz-mica vein lying west of the main mineralized zone has yielded specimens of huebnerite containing 92.8 percent $MnWO_4$ and 7.2 percent $FeWO_4$.

Development on the property consists of a 100-foot inclined shaft with an undetermined amount of drifting and 6 small prospect cuts along the strike of the deposit. An estimated production of $1,400 is given for the year 1906, the last date of activity on the property. The ore was reportedly shipped to Germany.

Ref: 14, p. 28; 37, pp. 156-157; 52, pp. 51-52; 68, p. 223.

C-39, Tungsten Lode, Tungsten,
Unorganized District, Pennington County

The Tungsten lode, formerly owned by Wehrlick, Faust, and Gowan, consists of one unpatented claim. It is 6 miles south of Hill City in the SW1/4 sec. 18, T. 2 S., R. 5 E. 3/4 mile southwest of the Grizzly Bear mine. The property is probably one of the Wolfram claims mentioned by Hess.

A pegmatite dike about 30 feet thick has been traced for 350 feet in a northerly direction. It dips to the west conformably with the schists. The pegmatite consists primarily of feldspar, quartz, and muscovite; wolframite is most abundant in the parts low in feldspar. Tourmaline and garnet are accessory minerals. Schist inclusions are noted within the pegmatite.

Development has been by small opencuts. There has been no recorded production and probably no activity at the property since before 1914.

Ref: 14, p. 29; 32, p. 154; 37, p. 164; 52, p. 52.

C-40, Michigan Placer Ground, Tungsten, Hill City District, Pennington County

The Michigan placer ground (M. E. 039020) consists of about 90 acres in the S1/2 sec. 8, T. 2 S., R. 5 E. It is in Palmer Gulch about 4-1/2 miles south of Hill City. It was formerly owned by Ed Nelson of Hill City.

Wolframite in small crystals occurs in a pegmatite dike and in a quartz vein. The pegmatite consists of feldspar, quartz, muscovite, garnet, and tourmaline. Mica is concentrated along the contact with the schist. The quartz vein, 3 inches to 3 feet in thickness, is conformable with the schist and dips 15° northwest.

This prospect has been developed by several small test pits. There has been no recorded tungsten production, and the history of the ground as a gold placer is not known.

Ref: 14, p. 28; 37, p. 150; 52, p. 52.

C-41, Pettit and Pfander's Claim, Tungsten, Hill City District, Pennington County

This claim consists of 1 unpatented lode of approximately 20 acres. It is on the north side of Palmer Gulch in the center of sec. 5, T. 2 S., R. 5 E. 3 miles southeast of Hill City.

A coarse pegmatite dike 30 feet thick is cut by a gouge-filled fissure from 3 inches to 2 feet in width. The gouge, which consists of clay, brown chalcedony, limonite, and manganese oxide, apparently represents the residual material left by extreme weathering of a tungsten-bearing dike. Tungsten minerals, in druses, occur on the pegmatite surfaces and extend into the gouge. Wolframite crystals are coated with limonite and manganese oxides. Small quantities of scheelite occur on the wolframite crystals. Several other thin tungsten-bearing quartz veins are exposed elsewhere on the dike, and other massive pegmatites occur on the property.

Development consists of a 20-foot shaft and a cut into the face of the dike 10 feet high and 25 feet long. There has been no activity on the property for many years, and no production has been recorded.

Ref: 14, p. 28; 32, pp. 153-154; 37, p. 155; 52, pp. 52-53.

C-42, Wolfram Lode, Tungsten, Hill City District, Pennington County

The Wolfram lode consists of 1 unpatented claim 1/2 mile west of Hill City in the SE1/4 sec. 23, T. 1 S., R. 4 E. It is 600 feet southeast of the Annie No. 1 claim and was formerly owned by Fred and Harry Mills.

A quartz vein, 2 to 3 feet in width, strikes N. 10° W. and dips 80° northeast. It cuts graphitic schist, which has a similar strike but dips southwest. Small grains of wolframite are associated with graphite and mica along the margins of the dike.

Development is reported to consist only of shallow trenches and test pits along the strike of the vein. No production has been recorded.

Ref: 14, p. 29; 32, p. 154; 37, p. 166; 52, p. 62; 68, p. 220.

C-43, Annie No. 1 Lode, Tungsten, Tin, Hill City District, Pennington County

The Annie No. 1 lode in Slaughterhouse Gulch 1/2 mile west of Hill City is in the SE1/4 sec. 25, T. 1 S., R 4 E. Originally owned by Mills Brothers of Hill City, it subsequently was acquired by the National American Tin Corp. as part of their Mohawk group. It has also been known as the Tin Spike.

Two quartz veins on the property carry wolframite associated with graphite and muscovite. A smaller "vein", 4 to 6 feet in width, strikes N. 20° W. and dips steeply to the east. It is apparently a quartz-mica segregation within an associated pegmatite dike. The main dike contains quartz, feldspar, muscovite, cassiterite, and a little wolframite. The wolframite, graphite, and muscovite are concentrated along the outer walls of the quartz mass.

The second quartz vein, 8 to 10 feet in thickness, lies 50 feet east of the first. It strikes N. 10° E., dips 35° W., and contains minor quantities of wolframite.

Small quantities of both tin and tungsten ore are said to have been recovered from the Annie, but there is no definite production record of either.

Ref: 13, p. 24; 14, p. 24; 25, pp. 35-36; 32, pp. 142-143; 37, p. 123; 52, pp. 61-62.

C-44, Vida May, Tungsten, Unorganized District, Pennington County

The Vida May claim, formerly owned by Pettit and Nash, consists of one unpatented claim near the mouth of Palmer Gulch. It is 4-1/2 miles southeast of Hill City in the SE1/4 sec. 33, T. 1 S., R. 5 E.

The geology has been described by Hess. A quartz vein lies in the fissure along a fault plane in the pre-Cambrian schists. It varies up to 10 inches in thickness and has been traced for about 100 feet along the outcrop. The strike is irregular but is roughly east-west. The dip is about 30° or more to the south. Wolframite, in masses up to several inches in diameter, occurs in the quartz in association with muscovite. The presence of a thin layer of graphite on each side of this vein and in other quartz veins in the Hill City area led Hess to conclude that the graphite was segregated from the associated graphitic schists and deposited from solution by the hot waters that formed the vein itself.

This is an old prospect developed only by a series of small test pits and trenches along the strike of the vein. No production has been reported.

Ref: 14, p. 29; 32, pp. 52-53; 37, p. 165; 52, pp. 53-54.

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C-45, White Swan (M. S. 689), Tungsten,
Hill City District, Pennington County

The White Swan claim is located adjacent to the east edge of the townsite of Hill City, about 200 yards northeast of the Burlington Railway station. It is a small patented claim of about 5-1/2 acres, located in the NE1/4SW1/4 sec. 30, T. 1 S., R. 5 E. Originally owned by M. E. Hayes of Hill City, it is better known as Hayes' claim.

A pegmatite dike strikes N. 25° W., essentially parallel to the strike of the enclosing schists. It is vertical and about 3 feet thick near the south end. To the north it thickens and dips steeply to the west. Small crystals of wolframite are associated with feldspar, muscovite, and quartz. An analysis of the wolframite, made at the South Dakota School of Mines, shows 36.3 percent $FeWO_4$ and 63.7 percent $MnWO_4$.

The dike has been prospected along a total length of about 200 feet by a series of small cuts and prospect pits. Lincoln reports tungsten production from this property valued at $300. There has been no development or mining on the pegmatite since 1918.

Ref: 14, p. 29; 37, p. 165; 52, p. 61.

C-46, Gira's Claim, Tungsten,
Hill City District, Pennington County

What has been referred to in the literature as Gira's or Gireau's tungsten claim lies along the south edge of sec. 26, T. 1 S., R. 5 E. 4-1/2 miles east of Hill City. It consists of 1 unpatented claim of approximately 20 acres adjacent to U. S. Highway 16-A.

According to Runner, who visited the property in 1918, wolframite occurs in a quartz vein cutting pre-Cambrian schist. The claim has been developed by a 30-foot inclined shaft in the plane of the vein. This is an early day prospect, and the shaft was inaccessible as early as 1918.

No production has been recorded.

Ref: 14, p. 26; 37, p. 138; 52, p. 16.

C-47, Samelias (Hopeful), Tin,
Unorganized District, Pennington County

The Samelias property consists of 2 unpatented claims totaling approximately 40 acres. It is located in the NE1/4 sec. 35, T. 1 S., R. 5 E. about midway between Hill City and Keystone. This is one of the properties owned and developed by the Harney Peak Tin Mining, Milling, & Manufacturing Co. It has recently been held by location by H. G. and B. A. Hardesty of Keystone as the Good Hope Nos. 1 and 2.

Each claim covers a lens-shaped quartz mica vein carrying cassiterite and arsenopyrite. On the No. 1 claim the vein varies from 6 inches to 4 feet in thickness and can be traced for about 75 feet. About 400 feet east, on the No. 2 claim, the vein is 115 feet long and varies from 3 to 3-1/2 feet in width on the surface. The veins are essentially parallel in strike and dip steeply toward one another at the shafts.

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Development was by six shafts. Those on 1 dike are reported to have been 100, 40, and 35 feet in depth; those on the other, 100, 40, and 15 feet deep. All are now inaccessible because of caving or water.

Apparently the only ore mined was that produced during development in the 1880's. Some Hopeful ore was included in a test shipment to England in 1888.

Ref: 13, pp. 16-17; 25, pp. 36-37; 37, pp. 143-144; 65, p. 513.

C-48, Gertie, Tin,
Hill City District, Pennington County

The Gertie property consists of 2 patented claims totaling 40 acres. It is located 1/2 mile southwest of Hill City in the NE1/4 sec. 36, T. 1 S., R 4 E. It was one of the original holdings of the Harney Peak Co. and was subsequently operated by Mr. E. C. Johnson of Hill City.

Cassiterite is associated with two nearly parallel pegmatite dikes. The principal dike is about 3 feet in thickness and dips 45° to the southwest. It has an observed length on the outcrop of 150 feet. Minerals of the pegmatite are feldspar, quartz, and muscovite, with accessory cassiterite and tourmaline. The cassiterite occurs in minute grains in fine-grained parts of the mass, but in crystals up to 1 inch in length in the coarse-grained rock. A second dike, 20 feet northwest, varies from a few inches to 4 or 5 feet in width and can be traced for over 1/2 mile.

The principal dike has been developed by a 500-foot inclined shaft in the plane of the vein. There was considerable drifting and stoping from the 100- , 200- , 300- , and 400-foot levels. Work to 400 feet was done by the Harney Peak Co. about 1890. After a period of inactivity, the Gertie Mining Co. did additional work deepening the shaft and built a small mill between 1905 and 1908. There has been no activity since that date.

Production in the first period of development is not known. At least 2,006 pounds of Gertie ore was shipped to England for testing in 1888. During the second period, 1.8 tons of concentrates containing 60 percent tin was produced in 1906. Several hundred pounds of metallic tin was produced in 1907.

Ref: 2, p. 189; 8, p. 147; 13, p. 26; 25, pp. 24-27; 32, pp. 135-137; 37, p. 138; 65, p. 536.

C-49, Addie Lode (M. S. 585), Tin,
Hill City District, Pennington County

The Addie consists of 1 patented 10-acre claim located in the SE1/4SE1/4 sec. 28, T. 1 S., R. 5 E. about 3 miles east of Hill City. It was originally owned and developed by the Harney Peak Co., but has recently been held by the New El Dorado Mines, Inc., of Rapid City.

The pegmatite dike is about 6 feet wide at the collar of the shaft. It strikes northeast and dips about 65° northwest. At the 200-foot level the vein is reported to have varied from a few inches to 6 to 9 feet. At greater depth the vein was never over a few inches in thickness. There is apparently some doubt as to whether the development followed the main vein below the 400-foot level.

Under management of the Harney Peak Co., an 800-foot, 3-compartment shaft was sunk, and extensive drifting was done on the 135- , 200- , 300- , and 400-foot

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levels. A raise to the surface from the 200-foot level was located 200 feet south of the main shaft. The main shaft was caved and only a crater could be seen when the property was visited by Garner in 1938.

Production from the Addie lode has been small. It is reported that the Harney Peak Co. mill a few cars of this ore. At least 800 pounds of Addie ore was shipped to England for testing in 1888. Before 1920, small quantities of ore are reported to have been hand-sorted from the dump and treated at the custom mill at Hill City.

Ref: 13, p. 24; 25, pp. 29-30; 61, 1892; 65, p. 513.

C-50, Coats Dike, Tin, Tungsten,
Hill City District, Pennington County

The George W. Coats property originally consisted of 3 patented 10-acre claims in the NE1/4 sec. 35, T. 1 S., R. 4 E. 1-1/2 miles southwest of Hill City. The claims were located in 1884 and later sold to a New York company. The group was subsequently sold to the Harney Peak Tin Mining, Milling, & Manufacturing Co. and was included in their Cowboy group.

Cassiterite occurs in a dike consisting dominantly of quartz, muscovite, and some graphite. The cassiterite is associated with the mica. Traces of wolframite have also been reported. At the surface the dike is 1 to 6 feet wide and about 200 feet long. It dips 75° to the east.

The first important development consisted of a 6 by 8 foot shaft, 100 feet deep, put down by the New York company. The Harney Peak Co. sank a 6 by 12 foot shaft to a depth of 400 feet. Extensive drifting in the vein was apparently done on the 60- , 125- , and 225-foot levels. The shaft appears to have passed out of the vein below the 225-foot level.

Production data are incomplete. In 1888, 2 cases of Coats ore, weighing a total of 2,670 pounds, was shipped to England for testing. The following year a rich stope on the 60-foot level is reported to have been mined. There has been no activity at the property since the collapse of the Harney Peak Co. in 1894.

Ref: 8, p. 147; 25, pp. 22-25, fig. 4; 52, p. 62; 65, p. 514.

C-51, Blue Bird Claim, Tin,
Hill City District, Pennington County

The Blue Bird consists of 1 unpatented claim in sec. 34 or 35, T. 1 S., R. 4 E. 1-1/2 miles southwest of Hill City. It was one of the holdings of the Harney Peak Tin Mining, Milling, & Manufacturing Co.

Cassiterite occurs in a pegmatite dike, which strikes north-south and dips 65° east. It has a maximum thickness of 14 feet on the outcrop. According to Hess, the pegmatite is cut off by faulting at a depth of 40 feet, and the offset portion has not been located. The coarse pegmatite of the dike is cut by narrow, veinlike segregations of muscovite, quartz, and a little feldspar. Cassiterite occurs with the mica as irregular grains and small euhedral crystals.

Development was apparently confined to a few feet of sinking and drifting in an effort to locate the offset segment of the dike. There has probably been no activity on the property since the collapse of the Harney Peak Co. There is no known production.

Ref: 13, p. 24; 32, p. 137; 37, p. 127.

C-52, Campaign (M. S. 625, 641), Tin,
Hill City District, Pennington County

The Campaign group consists of 2 patented 10-acre claims, the Campaign Nos. 1 and 4 in the W1/2 sec. 25, T. 1 S., R. 4 E. 1/2 mile west of Hill City. It was formerly owned by the Harney Peak Tin Mining, Milling, & Manufacturing Co.

Very little development has been done on the property. Two cases of Campaign ore, grossing 2,415 pounds, was included in a shipment of 40 tons of Black Hills tin ores shipped to England for testing and promotion in 1888.

Small crystals of beryl have also been reported from quartz-mica veins on these properties.

No production has been recorded.

Ref: 8, p. 147; 14, pp. 7, 25; 37, p. 128.

C-53, White Whale Group, Tin,
Hill City District, Pennington County

The White Whale group consists of 4 patented claims totaling about 40 acres. They lie 1/2 mile east of Hill City in the SE1/4 sec. 30 and extend into the NE1/4 sec. 31, T. 1 S., R. 5 E. They are the White Whale (M. S. 664), Colossal (M. S. 621), La Grande (M. S. 662), and Mewonitoc (M. S. 620), all formerly part of the Harney Peak Co. holdings.

Each claim includes one or more tin-bearing pegmatite dikes. The dike on the Colossal, 10 to 15 feet in width, has been developed by a 20-foot shaft and a 75-foot adit in the vein. The Mewonitoc dike averages 8 feet in width. A 300- to 400-foot drift, a 40-foot shaft in the dike, and an opencut in an adjacent dike constitute the development. The shaft was cleaned out during the second period of tin interest in 1910. On the White Whale No. 1, a resistant dike 15 feet wide and 200 feet long has been explored by a 75-foot incline, which follows the footwall.

Three cases of ore from the Mewonitoc, grossing 3,861 pounds, was included in a test shipment to England in 1888.

Ref: 8, p. 147; 13, pp. 26, 29; 25, pp. 30-31; 65, pp. 513-514.

C-54, Tenderfoot Group, Tin,
Unorganized District, Custer County

The Tenderfoot group consists of 4 patented claims located in the center of the E1/2 sec. 33, T. 2 S., R. 4 E. It includes the Japanzy, Szar, and Szar Nos. 1 and 2 on the west side of Tenderfoot Gulch about half way between Hill City and Custer on U. S. Highway 16-A. Originally a holding of the Harney Peak Tin Mining, Milling, & Manufacturing Co., it was later held by E. C. Johnson and has more recently been acquired at tax sale by Bert Robinson of Custer.

On the outcrop the dike is 6 feet wide, and it can be traced for about 500 feet. It strikes N. 30° W. and dips 60° to the east. Cassiterite apparently was distributed very unevenly throughout the dike. Some very rich float boulders were noted below the outcrop.

Development work was done about 1890. The Japanzy tunnel, 996 feet long, was driven at creek level to intersect the ledge 300 feet below the outcrop. At least 600 feet of drifting was done in the vein from the intersection of the long tunnel and the 300-foot inclined shaft. Two shorter adits up the slope intersect the shaft.

A total of 870 pounds of Szar ore was included in the 40-ton test shipment made to England in 1888.

According to local reports, 5 or 10, 25-ton cars of ore from development work was shipped to the Hill City mill in 1890. Except for this test run, no production is recorded.

Ref: 8, p. 147; 13, p. 28; 65, p. 536.

C-55, Cowboy, Tin,
Hill City District, Pennington County

The Cowboy lodes consist of 3 patented 10-acre claims 1 mile west of Hill City. One is in the NW1/4 sec. 36; the others straddle the corner common to secs. 25, 26, 35, and 36, T. 1 S., R. 4 E. They were located in 1884 and were soon purchased by the Harney Peak Tin Mining, Milling, & Manufacturing Co. It has successively been operated by the companies listed below.

The Cowboy ore body consists of a quartz-mica vein, which strikes northwest and dips 68° to the northeast. It can be traced on the surface for 200 feet and for 425 feet on the 100-foot level. It narrows with depth on subsequent levels. The vein ranges from 1-1/2 to 4 feet in width, with an average stoping width of 2-1/2 feet. The cassiterite, closely associated with fine-grained mica, appears to lie in two large shoots.

Development, most of which was done by the Harney Peak Co., consists of a 100- and a 300-foot inclined shaft, raises, and 2,150 feet of lateral workings. Considerable stoping was done above the 100-foot and between the 100- and 200-foot levels, and much broken ore is said to remain in the lower stopes. The property has been idle since 1920, except for brief periods of unwatering and examination in 1940 and 1943 by the New Cowboy Mining Co.

Production records are very incomplete. It has been estimated by Lincoln that 4,000 tons of ore have been removed from the stopes. Ore from the Cowboy was included in the 50-ton test shipment to England in 1888.

A summary of known records follows:

1883-94 - Harney Peak Tin Mining, Milling, & Manufacturing Co. - some ore shipped to mill

1916 - Hill City Tungsten Producers Co. - "several tons concentrates"

1917 - American Tin & Tungsten Co. - 23 tons concentrates carrying 50 percent tin

1920 - National Tin Corp. - 12 tons concentrates

Ref: 8, p. 147; 19, pp. 207-218; 25, pp. 16-22; 37, pp. 131-132.

C-56, Mateen or Century (M. S. 1959), Lithium, Tin, Hill City District, Pennington County

The Century is a 20-acre patented lode claim in the NW1/4 sec. 31, T. 1 S., R. 5 E., 1/2 mile south of Hill City.

There are two principal pegmatite dikes on the property. The northernmost is exposed for a length of 800 feet and a maximum width of 50 feet. It strikes southeast and dips steeply to the northeast. Diamond drilling indicates that the dike is very irregular below the surface and extends for 100 to 200 feet in depth.

The southern dike is well exposed for a length of 300 feet. The hanging wall is exposed in a shaft near the south end to a depth of about 65 feet.

Each dike is composed of 3 zones: (a) An outer or wall zone of quartz-albite; (b) an intermediate zone of quartz-albite-microcline; and (c) a core of quartz-albite-microcline-spodumene pegmatite. Most of the spodumene is in crystals averaging 1/2 by 1 by 6 inches.

The property was examined by F. C. Lincoln in 1942. Development at that time consisted of three shafts and several open pits and cuts, probably all done by the old Harney Peak Co. An extensive program of trenching and diamond drilling of the northern dike was completed by the Federal Bureau of Mines and the Federal Geological Survey in 1945. In 1950 the Lithium Corporation of America began mining spodumene from the property. It is taken by truck to Keystone and run through the Edison mill. No estimate of tonnage is yet available.

C-57, Louise and Hunter, Lithium, Tin, Oreville District, Pennington County

These two unpatented claims are located in the SW1/4 sec. 22 and the NW1/4 sec. 27, T. 2 S., R. 4 E., essentially on the Pennington-Custer County line.

The 2 claims are located on the same pegmatite dike, which is discontinuously exposed for about 600 feet. It strikes N. 25° E. and dips 65° west. There is a thin zone of scrap mica along the hanging wall. Spodumene is the principal valuable mineral. It occurs with quartz in a zone 3 to 10 feet wide parallel to the length of the dike. Individual crystals range from 6 inches to 2 feet in length, and some are longer. Analyses of the spodumene indicate an average of 6.5 percent Li_2O.

Development has been by opencuts on each claim. The largest on the Louise is 140 feet long, 20 to 30 feet wide, and up to 30 feet in depth. That on the Hunter is 22 feet long, 13 feet wide, and 8 feet deep. An aerial tramway formerly extended from the dike to the Highway (U. S. 16-A).

A small tin-bearing pegmatite on the Louise claim has been explored by five small test pits.

Production records are incomplete. Ninety-eight tons of spodumene was produced before September 1938. Scrap mica and potash feldspar could also be recovered in small quantities.

Ref: 30, pp. 57-58; 32, pp. 139-140.

C-58, Cassiterite (M. S. 459), Tin, Hill City District, Pennington County

The Cassiterite tin prospect consists of the south 900 feet of the Cassiterite patented tin lode, containing 6.12 acres. It is located 3/4 mile northwest of Hill City in the NE1/4 sec. 25, T. 1 S., R. 4 E. It was formerly held by the National American Tin Co. but is now owned by G. W. Coats, H. G. Mills, and F. C. Mills of Hill City. It adjoins the Tin Boom and Mohawk properties.

The ore body is a cassiterite-bearing quartz vein, which strikes N. 20° W. and dips 45° to 70° northeast. The average thickness is about 24 inches. It cuts schists, which strike N. 20° E. and dip 50° northwest. The vein consists of quartz, muscovite, cassiterite, and a few crystals of beryl. The cassiterite occurs as irregular masses up to 2 inches in diameter associated with the mica.

Development in the vein consists of 2 shafts 12 and 25 feet in depth, with a short crosscut off the bottom of the deeper one. Trenches expose the vein for about 75 feet along the outcrop. A 30-foot vertical shaft is sunk in the schist 75 feet southeast of the vein.

No production has been recorded.

Ref: 13, p. 25; 37, p. 129.

C-59, Wood Tin (M. S. 1646), Lithium, Beryllium, Keystone District, Pennington County

The Wood Tin is a 20-acre patented lode situated on Iron Creek about 3 miles southeast of Keystone. It is located in the NE1/4SE1/4 sec. 14, T. 2 S., R. 6 E. The property is owned by the Maywood Chemical Works of Maywood, N. J., and has been operated intermittently under lease to Harry A. Linde.

The ore body is a large, irregular pegmatite dike. The main part strikes N. 70° W. and is 170 by 80 feet in section. At the east end the mass extends 50 feet northeast as an irregular body up to 40 feet in width. The pegmatite is distinctly zoned. The outer zones consist of perthite, quartz, cleavelandite, and muscovite. Beryl crystals 10 to 24 inches in diameter are associated with the albite, muscovite, and quartz. A core up to 40 feet in thickness consists of quartz and spodumene. Spodumene is estimated to comprise 5 percent of the core.

Except for a short tunnel, a raise, and a few small cuts, the mining has been concentrated on the southeast extension of the main dike.

Production

1899-1901	- 2 carloads spodumene
Before Nov. 1, 1942	- 544.79 tons scrap mica 230.66 tons soda feldspar 36.5 tons beryl 70.66 tons potash feldspar
January-November 1943	- 17.53 tons beryl
November 1943-August 1944	- 40.2 tons beryl
August 1944-January 1945	- 7.42 tons beryl

C-60, Mohawk (M. S. 456), Tin,
Hill City District, Pennington County

The Mohawk lode is a 10-acre claim located on the north side of Allen Gulch, 1/2 mile west of Hill City. It lies in the NE1/4SE1/4 sec. 25, T. 1 S., R. 4 E. The first tin claim located in the Hill City area, it was filed upon in August 1883. It was one of the holdings of the Harney Peak Co. and has most recently been held by G. W. Coats and H. G. and P. W. Mills of Hill City.

The Mohawk tin vein strikes N. 20° W. and has a variable dip to the northeast. It crops out as 2 quartz lenses separated by a 150-foot break. These vary from 8 inches to 48 inches in thickness. Where the vein is thin, the minerals are quartz with a thin border zone of muscovite, beryl, and cassiterite. The wider parts contain more quartz.

Development consists of 3 inclined shafts, 111, 42, and 64 feet deep. There are reported to be 829 feet of lateral driftings from the 3 shafts. Development has been in three stages: First, by the Harney Peak Co., 1884-94; second, by three successive operators, 1915-20; and last, by the Barium Stainless Steel Co., 1944.

Production figures are very incomplete. Apparently, the only ore taken out by the Harney Peak Co. was that incidental to sinking the 42-foot shaft. Small-scale mining was carried out 1915-20 by a succession of operators, but ores from several properties were combined and no separate production figures are available. Under various operators, the Mohawk has included from three to eight adjacent patented claims.

Ref: 13, p. 17; 25, pp. 32-33, fig. 6; 37, p. 151.

C-61, Carnbray, Snowshoe, and Tin Belle, Tin,
Hill City District, Pennington County

The Carnbray tin prospect is in the NW1/4 sec. 21, T. 1 S., R. 5 E in the same section as the old J. R. gold mine. According to Ziegler, the cassiterite occurs in "albitic muscovite granite," similar in appearance to the ore in the Coats and Gertie lodes.

The Snowshoe and Tin Belle lodes are located in the NE1/4 sec. 21, T. 1 S., R. 5 E. on the Penalauna patented homestead. They cover a dike which is 3 feet wide and which has been explored along its strike by a 75-foot drift. Small grains of cassiterite are scattered through pegmatite. Fifty feet from the adit a 40-foot drift has been driven in an 18-inch dike whose relation to the larger dike is not known. Gardner estimated the dump from the shorter drift would run from 1 to 2 pounds of cassiterite to the ton.

There has been no recorded production from any of these prospects.

Ref: 13, pp. 25, 28; 25, p. 40; 37, p. 129; 68, pp. 103-104.

C-62, Excelsior (M. S. 583), Tin,
Hill City District, Pennington County

The Excelsior lode comprises 1 patented 10-acre claim in Palmer Gulch in the NE1/4 sec. 8, T. 2 S., R. 5 E. It was originally held by the Harney Peak Tin Mining, Milling, & Manufacturing Co.

A quartz-muscovite vein, 3 to 4 feet wide at the surface, was developed as a tin prospect by the Harney Peak Co. using a 100-foot shaft. Two cases of Excelsior ore, with a gross weight of 6,781 pounds, were shipped to England for experimental and promotional purposes in 1888.

There is no record of subsequent development of the property.

Ref: 5, p. 212; 8, p. 147; 65, p. 513.

C-63, Jolly Group, Tin,
Hill City District, Pennington County

The Jolly group consists of 3 patented 10-acre claims, which lie near the north end of the line common to secs. 32 and 33, T. 1 S., R. 5 E. They are located along the old Hill City-Keystone road, about 2 miles east of Hill City. These were originally holdings of the Stevens Mining Co., which owned 13 tin prospects in the Hill City area in 1888.

No description of the geology is available. According to Lincoln, an unspecified amount of tin ore was mined from the Jolly claims by the Hill City Tungsten Producers Co. in 1915. A total of 43 tons of ore carrying between 1-1/2 and 3 percent metallic tin was taken from the Jolly and Mohawk mines. The property has been idle since that time.

Ref: 13, pp. 13, 26.

C-64, Tin Boom, Tin,
Hill City District, Pennington County

The Tin Boom Nos. 1 and 2 claims are located in the NE1/4 sec. 25, T. 1 S., R. 4 E. 1/2 mile west of Hill City. They are adjacent to the Mohawk mine and have sometimes been included in the so-called Mohawk group. The dikes on the property have also been filed upon as the General Harney, Golden Slipper, and Tin Spike No. 1.

The General Harney dike is 12 to 15 feet in width at the surface and 240 feet long. It strikes northwest. At the 100-foot level, it is reported to be 6 feet wide and 150 feet long. The dike is dominantly soda spar, with mica, quartz, and cassiterite. The latter occurs sparsely in both the feldspar and associated with the mica. Principal development of the property was in 1920, when the National Tin Co. put down a 100-foot inclined shaft with several hundred feet of drifting and crosscutting. Smaller shafts and pits were previously dug by the Harney Peak Co.

Several smaller dikes are exposed on the property. The Tin Boom quartz vein carries cassiterite and traces of beryl. It has been explored by several small pits and shafts. Twenty-five to fifty tons of tin ore is said to have been removed from a cut on this dike.

Despite the extensive development, Gardner states that it is doubtful if any tin has been produced from the Tin Boom property, though some float boulders may have been shipped to the mill by the Harney Peak Tin Mining, Milling, & Manufacturing Co.

Ref: 13, p. 28, fig. 9; 25, pp. 33-35; 32, p. 143; 37, pp. 162-163.

C-65, Tin Queen (White Blowout), Tin, Lithium, Mica, Feldspar, Unorganized District, Pennington County

The Tin Queen property lies 6 miles southeast of Hill City in the NW1/4 sec. 24, T. 2 S., R. 4 E. It is close to the St. Elmo and Clara Belle gold mines.

Several pegmatite dikes crop out on the property. The Tin Queen mica mine is developed in a lenticular dike 185 feet long and 120 feet in width, which is known also as the White Blowout. It strikes N. 10° E. and dips to the west. The dike is poorly zoned but contains mica, albite, perthite, quartz, amblygonite, and beryl. Several phosphate minerals, columbite-tantalite, and pollucite are also present. To the west, a dike about 50 feet in thickness contains a 4-foot zone of muscovite and quartz, which carries noticeable quantities of cassiterite. It was regarded as one of the more promising tin prospects by Hess, who examined it in 1908.

Early day production was apparently limited to two carloads of amblygonite shipped before 1908. Since 1943 the dike has been an active producer of sheet mica, scrap mica, feldspar, beryl, amblygonite, and columbite-tantalite.

Partial production figures are as follows:

Year	Sheet mica, pounds	Untrimmed punch, pounds
1943............	26	-
1944............	1,597	-
1945 (part).....	74	900

Ref: 32, p. 141; 37, p. 163.

C-66, Tin Chance and No. 1, Tin, Hill City District, Pennington County

The Tin Chance lodes are in the SE1/4 sec. 25, T. 1 S., R. 4 E. about 1 mile southwest of Hill City.

The Tin Chance vein consists of three lenses aligned in a northwest direction. The southeast lens, which is the largest, averages 12 inches in thickness over a length of 70 feet, but is thinner elsewhere. At the main shaft it strikes N. 57° W. and dips 60° northeast. It consists of quartz and muscovite, with a little cassiterite and beryl. Development consists of an old 180-foot trench and a shaft sunk in 1942-44 by the Barium Stainless Steel Co. The other 2 lenses are 50 and 40 feet long and from 1 to 2 feet in width. No production is recorded.

On the Tin Chance No. 1, which adjoins the Tin Chance on the southwest, the vein is at least 80 feet long and from 1 to 2 feet in width. It strikes N. 45° W. and dips 70° northeast. Beryl crystals and cassiterite masses up to 2 inches in diameter are associated with quartz and muscovite. Prospecting has been by two open pits and a connecting trench so aligned as to expose the vein continuously for about 80 feet.

C-67, Deacon Wright, Tin, Unorganized District, Pennington County

The Deacon Wright lode is a short distance northeast of the Hunter and Louise lithia mine on the line between secs. 21 and 22, T. 2 S., R. 4 E. It lies on the slope of the narrow divide between Spring Creek and Tenderfoot Gulch 7-1/2 miles southwest of Hill City and a similar distance northwest of Custer.

Original from THE OHIO STATE UNIVERSITY

The ore body is a narrow pegmatite dike. At the outcrop it is about 4 feet in thickness and consists of mica-rich pegmatite with accessory cassiterite. Captain Josiah Thomas, who examined the property for the Harney Peak Tin Co. in 1892, concluded that the dike as a whole would run less than 5 pounds of cassiterite per long ton.

Development by the Harney Peak Co. consisted of a trench 40 feet long, and up to 15 feet in depth, extending along the strike of the outcrop. No production is indicated.

Ref: 13, p. 25; 65, p. 536.

C-68, Naiad Queen, Tin,
Hill City District, Pennington County

The Naiad Queen lode lies a short distance southwest of the Sally Cavanaugh mine on the line between secs. 15 and 22, T. 2 S., R. 4 E. It is 1/2 mile west of the old settlement of Oreville on the Deadwood branch of the Chicago, Burlington & Quincy Railroad and on U. S. Highway 16-A.

A pegmatite dike, 5 to 6 feet in width, strikes northeast and dips steeply to the northwest. It has been traced along the outcrop for 200 feet. Cassiterite occurs in small grains at several points.

According to Captain Josiah Thomas, who examined the mine for the Harney Peak Tin Mining, Milling, & Manufacturing Co. in 1892, a shaft sunk 43 feet on the vein revealed only traces of cassiterite. Several small pits have been cut where tin ore showed concentrations on the outcrop.

There has been no recent activity at the property.

Ref: 32, p. 139; 65, p. 536

C-69, Sally Cavanaugh, Tin, Mica,
Unorganized District, Pennington County

The Sally Cavanaugh property consists of one unpatented lode claim lying near the center of the S1/2 sec. 15, T. 2 S., R. 4 E. just west of the old Settlement of Oreville. Oreville lies on the Deadwood branch of the Chicago, Burlington, & Quincy Railroad about 7 miles southwest of Hill City.

A coarse pegmatite dike strikes N. 10° W. and has a nearly vertical west dip. It is over 375 feet in length and averages 15 feet in width. It is essentially conformable to the enclosing schist but locally crosscuts it. Minerals observed are quartz, cleavelandite, muscovite, and cassiterite. The cassiterite is associated with the muscovite in "shoots" up to 2 feet in thickness.

Development consists of several small cuts.

Ref: 2, pp. 174, 189; 32, pp. 138-139.

C-70, Butte (Truax Group), Tin,
Unorganized District, Pennington County

This group of early day tin prospects apparently lay between the Naiad Queen and Tin King prospects in the SE1/4 sec. 15, T. 2 S., R. 4 E.

Original from THE OHIO STATE UNIVERSITY

The only information on this group comes from the published notes of Captain Josiah Thomas, who examined the property briefly for the Harney Peak Tin Mining, Milling, & Manufacturing Co. in 1892. Thomas states that the ore body consists of a dipping pegmatite dike about 3 feet in thickness. A sample which he collected assayed 49 pounds cassiterite per long ton.

Development consisted of two shafts. One, which was sunk on the ledge itself, was 10 feet deep at the time of Thomas' visit. A vertical shaft began in the schist and intersected the dike at a depth of 72 feet but was inaccessible owing to water.

There has apparently been no subsequent development or production.

Ref: 13, p. 24; 65, p. 536.

C-71, Tin King, (Tin City) (M. S. 803), Tin, Unorganized District, Pennington County

The Tin King group consists of 3 patented 10-acre claims at Oreville near the junction of Tenderfoot Gulch with Spring Creek. The group is on the corner common to secs. 14, 15, 22, and 23, T. 2 S., R. 4 E.

Cassiterite occurs in two pegmatite dikes. The western dike is reported by Gardner to be 4 to 10 feet wide and about 115 feet long. It strikes northeast and dips about 65°. The rock is coarse-grained pegmatite with segregations of feldspar. Cassiterite-rich parts have been explored by an opencut 6 by 6 by 40 feet and two shafts 6 and 10 feet in depth.

The other dike, 350 feet to the east, strikes roughly north-south and dips 30° west. It has been developed by a 10-foot shaft, which reveals a thickness of 3 feet. A 70-foot inclined shaft following the dip was being sunk at the time of Thomas' visit in 1892, but has been filled with water at times of later examinations.

There is no record of development after about 1894, and no tin has been produced from the property.

Ref: 2, p. 191; 13, p. 28; 25, p. 39; 32, p. 139; 65, p. 536.

C-72, Flora, Tin, Unorganized District, Custer County

The Flora lode lies in the center of the SE1/4 sec. 32, T. 3 S., R. 5 E. 3 miles southeast of Custer. It is not certain that this is the Flora described in early reports on the Harney Peak Tin Mining, Milling, & Manufacturing Co. The following description applies to their property.

A pegmatite dike, which stands up well above the surrounding schist, can be traced for a considerable distance. It averages 30 feet in thickness.

Development at the time of Captain Josiah Thomas' visit in 1892 consisted of an opencut along the footwall 7 to 8 feet wide and 120 feet long. Cassiterite was apparently concentrated in a mica-rich zone of similar thickness. Two shafts, 25 and 40 feet in depth, were sunk to water on the dike. A vertical shaft begun in schist was calculated to encounter the dike at a depth of 150 feet but was stopped at the 80-foot level because of water trouble. Samples tested by Thomas yielded 39 pounds of cassiterite per long ton and, because of the large size of the dike, he considered it one of the most promising holdings of the Harney Peak Tin Mining, Milling, & Manufacturing Co.

Ref: 13, p. 25; 65, p. 536.

C-73, February Group, Tin,
Hill City District, Pennington County

The February group consists of several scattered patented claims in sec. 33, T. 1 S., R. 5 E. but extending into adjacent sections to the north and west. Seven claims appear to be patented.

Most of the development was done before the visit of Captain Josiah Thomas, who examined many of the properties of the Harney Peak Tin Mining, Milling, & Manufacturing Co. in 1892. Several thick pegmatites carry minor quantities of cassiterite. Thomas reported a 100-foot shaft on the No. 2 lode and a 100-foot shaft on one of the dikes near the north end of the group close to the Addie lode. The single sample tested by Thomas yielded only 13 pounds of cassiterite per long ton.

Ref: 65, p. 513.

C-74, Nevada No. 2, Tin,
Unknown

The Nevada No. 2 claim was held by the Harney Peak Tin Mining, Milling, & Manufacturing Co. about 1890. Its location is not now known.

The prospect was examined by Captain Josiah Thomas in 1892 while it was still the property of the Harney Peak Co. Cassiterite was reported by Thomas to occur in a large pegmatite dike. At that time, an exploratory shaft, reportedly 200 feet deep, had been sunk on the ledge. A sample taken by Thomas yielded 32 pounds of cassiterite per long ton.

There is no record of any production from the Nevada, though some of the ore produced during development may have been taken to the Hill City mill.

Ref: 37, p. 152; 65, p. 514.

C-75, Tin Plate, Tin,
Unorganized District, Pennington County

The Tin Plate group is in the NW1/4 sec. 11, T. 2 S., R. 4 E. about 4 miles southwest of Hill City.

The claims were visited by Hess during his examination of Black Hills tin properties in 1908. Several fine- to coarse-grained pegmatite dikes occur on the property. Hess noted very little cassiterite on the outcrop.

There is no record of any production from these claims.

Ref: 32, p. 138.

C-76, Olympia, Tin,
Unorganized District, Pennington County

The Olympia Tin prospect is apparently in the NE1/4 sec. 2, T. 2 S., R. 4 E. below the Bluebird on the same tributary of Spring Creek. It was formerly one of the properties of the Harney Peak Tin Mining, Milling, & Manufacturing Co.

The only description is by Hess, who visited the property in 1908. A pegmatite dike 3 feet thick and several hundred feet long strikes northeast and dips 45° to 55° northwest. The dike is rather fine-grained pegmatite, with a mica zone up to 6 inches thick along the hanging and footwalls. Cassiterite in tabular crystals up to 3/4 inch across and 1/8 inch thick occur with the mica. It seemed most abundant along a 75-foot interval on the hanging wall.

No production is recorded.

Ref: 32, p. 138; 37, p. 154.

C-77, First Find (M. S. 904), Tin,
Unorganized District, Pennington County

The First Find lode is located on the line between secs. 13 and 24, T. 2 S., R. 4 E. 6 miles southwest of Hill City and 2 miles east of Oreville. It is one of a group of three patented claims, which includes also the General Grant and Lulu Tin lodes.

A pegmatite dike, which strikes northwest and dips to the southwest at a low angle, can be traced for 3/4 mile. It is exposed on the southwest side of a small hill for a width of 100 feet. According to Hess, the dike carries both cassiterite and columbite-tantalite. An analysis of cassiterite from the First Find, made by Dr. W. P. Headden of the South Dakota School of Mines in 1890, shows 94.70 percent SnO_2.

Development consists of one small opencut, apparently made around 1890, but there is no record of any activity since that date.

Ref: 8, pp. 135, 141; 13, p. 25; 32, p. 142; 37, p. 138; 68, pp. 107-108.

C-78, Custer Group (M. S. 960), Tin,
Hill City District, Pennington County

The Custer group is 1-1/2 miles east of Hill City in the W1/2 sec. 29, T. 1 S., R. 5 E. Five patented 10-acre claims - the Custer, Jackson, Top Sheaf, J. O. Bates, and Spar lodes - are included.

It was formerly owned by the Harney Peak Tin Mining, Milling, & Manufacturing Co., and at least some of the claims were later held by the National American Tin Corp.

A crate of ore from the Custer property, grossing 1,344 pounds, was included in the 40-ton test shipment made to England in 1888 by Prof. M. C. Vincent for the Harney Peak Co.

There is no record of any production from these claims.

Ref: 8, p. 147; 13, p. 25; 37, p. 132.

C-79, Ida (Ida Tin) (M. S. 663), Tin, Lithium,
Hill City District, Pennington County

The Ida Tin patented lode is on the line between secs. 27 and 28, T. 1 S., R. 5 E. northeast of and adjacent to the Addie lode.

A pegmatite dike strikes N. 40° E. and dips 60° northwest. It ranges from 5 to 10 feet in width and is about 600 feet long. It is a fine-grained pegmatite made up of albite, quartz, and muscovite with scattered cassiterite and spodumene. The spodumene occurs in blades 2 inches long and about 1/2 inch in thickness.

Development consists of 2 shallow shafts, 10 and 15 feet deep, and an 80-foot shaft, now caved. There has been no recorded production of either tin or spodumene.

C-80, Hardesty Homestead, Beryl, Mica, Tantalite,
Unorganized District, Pennington County

The Hardesty Homestead is located in the NE1/4 sec. 36, T. 1 S., R. 5 E about 6 miles east of Hill City on U. S. Highway 16-A. It is owned by George Hardesty of Keystone.

A large, irregular pegmatite strikes roughly north-south and dips steeply to the west. It is roughly 280 feet long and has a maximum width of 32 feet. The enclosing schists have a similar strike but dip to the east. The dike is well zoned. An outer zone of albite-quartz-muscovite carries beryl crystals up to 8 inches and some book mica. The second zone contains quartz and albite, with small amounts of muscovite. The third zone contains spodumene, amblygonite, and tantalite. The spodumene, in crystals up to 6 feet long, is largely altered to sericite. The amblygonite also is altered. Tantalite, in grains averaging 3/8 inch, is scattered through the zone, usually associated with albite. Some beryl occurs near the outer margin of the zone. The core of the dike is quartz. At the north end, between the quartz core and one of the outer zones, is a zone of perthite pegmatite with some beryl.

The dike was an early day tin prospect and was explored at that time by a 60-foot shaft and a small opencut. Development for pegmatite minerals began in 1940.

Up to July 1942 the dike had produced 7 tons of beryl, 25 to 30 tons of scrap mica, 300 to 600 pounds of tantalite, and 5 tons of soda spar. During 1943-44, 4,250 pounds of beryl and 749 pounds of tantalite were sold.

Ref: 7, pp. 51, 73, fig. 43; 25, p. 40.

C-81, Ingersoll, Lithium, Beryl, Mica,
Keystone District, Pennington County

The Ingersoll group includes 3 patented claims, the Bob Ingersoll, the Ben Butler, and Horace Greeley, in the NW1/4 sec. 6, T. 2 S., R. 6 E. 2 miles northwest of Keystone. They were owned by the Harney Peak Co. and by several subsequent owners before being acquired by Black Hills Keystone Co. in 1933.

Five dikes appear on the property, of which two - the No. 1 and No. 2 - have been exploited. Dike No. 1, the "upper dike", is a steep pipelike body, which plunges to the southeast. Most of the mining has been by means of a glory hole. Lepidolite, beryl, columbite-tantalite, amblygonite, mica, feldspar, and cassiterite have been produced. Dike No. 2 is also pipe shaped and plunges southeast. In horizontal cross section at the main level, it is 110 by 80 feet. This dike is well zoned also. Mining has been by opencut, glory hole, and by stoping in a sublevel. Mica, columbite-tantalite, spodumene, amblygonite, feldspar, and beryl have been produced. Unique are masses of amblygonite up to 8 tons and single beryl crystals up to 30 tons.

Production from the two dikes, 1922-24, includes: 606.7 tons amblygonite, 8,091.4 tons lepidolite, 408.9 tons beryl, 4,470.1 tons perthite, 104.9 tons cleavelandite, 77 tons spodumene, 1,759.1 tons mica, about 1 ton cassiterite, and 1,500 pounds tantalite, plus materials still in stockpile December 31, 1944.

Ref: 7, p. 51, table 5; 30, pp. 29-31.

C-82, Tin Center (Liberty Bell), Tin,
Hill City District, Pennington County

The Tin Center, formerly known as the Liberty Bell, consists of one unpatented lode claim at Hill City. H. C. Mills is the last locator, but the property has successively been owned by the Harney Peak Tin Mining, Milling, & Manufacturing Co. and the National Tin Corp.

A pegmatite dike 12 to 30 feet wide and 400 feet in length strikes N. 40° W. and dips to the east. It stands out as a conspicuous topographic feature. Very small quantities of cassiterite occur with mica along the hanging wall.

Development work is scattered over the southernmost 100 feet of the outcrop. Most of it was done by the Harney Peak Tin Mining, Milling, & Manufacturing Co. A trench 6 by 6 by 12 feet, 4 cuts, the largest 7 by 14 by 11 feet, and a 40-foot shaft inclined 55° to the east, are noted by Gardner, who examined the property in 1938.

There has been no tin production from the Liberty Bell dike.

Ref: 25, pp. 42-43.

C-83, Ottumwa, Tungsten, Tin,
Unorganized District, Pennington County

The Ottumwa lode is 4 miles east of Hill City, too indefinite to locate on map.

The following description is primarily from Hess, who visited the property briefly in 1908.

Cassiterite occurs in two dikes on the property. One is a quartz vein, with quartz, wolframite, tourmaline, feldspar, mica, and cassiterite. Nearby is a thin quartz-rich pegmatite dike carrying cassiterite, which Ziegler describes as small, brown, resinous grains occurring in milky quartz.

No recent information is available, and no production has been recorded from the Ottumwa lode.

Ref: 32, p. 144; 68, pp. 104-105.

C-84, Sarah Group (M. S. 727), Tin, Tantalum,
Keystone District, Pennington County

The Old Sarah group consisted of three 10-acre claims that lie west of the Etta mine and 1 mile southeast of Keystone. They lie in the northeast corner of sec. 17 but extend slightly into sec. 8, T. 2 S., R. 6 E. Much of the area covered by this group is now part of the 20-acre Spodumene lode on which the Hugo mine is operated under lease by the Consolidated Feldspar Corp. For geology and recent development and production refer to the Hugo mine.

The pegmatite on this property was prospected early for tin and columbite-tantalite. A shipment of 530 pounds of tin ore from the Sarah lode was shipped to England for testing in 1888. Dr. W. P. Headden of the South Dakota School of Mines cited a single crystal of columbite measuring 8 by 14 inches and published analyses of the Sarah columbite in 1890.

Ref: 8, p. 147; 32, p. 161; 68, p. 190.

C-85, Cheyenne Lode, Mica,
Unorganized District, Custer County

The Cheyenne lode, consisting of 1 unpatented claim, lies adjacent to U. S. Highway 16-A, 6 miles north of Custer on the crest of the ridge forming the drainage divide between French and Spring creeks. It is in the NW1/4 sec. 27, T. 2 S., R. 4 E. It is held by location by Mary E. Michaud and L. E. Wright of Custer, S. Dak.

It is a small pegmatite dike containing feldspar, muscovite, quartz, and a little beryl. The beryl occurs as small crystals associated with mica along the contacts with the enclosing schist.

Mica production on a small scale began in 1942. It was sold to the Beach mill east of Custer. There has been no activity since the end of the war.

C-86, Big Smoke, Feldspar, Beryl,
Unorganized District, Pennington-Custer Counties

The Big Smoke group consists of three unpatented claims, the Big Smoke No. 1, Big Smoke No. 2, and the Trail Hill Feldspar dike. They are located on the Custer-Pennington County line 5 miles southeast of Keystone in the SW1/4 sec. 23, T. 2 S., R. 6 E. They adjoin the Put and Beryl claims on the north, and are also owned by the Consolidated Feldspar Corp., Trenton, N. J.

There are several pegmatite dikes on the claims, but the Big Smoke No. 1 is the only one of particular promise. It is a large, steeply dipping dike, which strikes N. 25° E. Minerals observed include pink potash feldspar, quartz, graphic granite, muscovite, tourmaline, and beryl. The beryl occurs in irregular segregations of mica.

Development, made before 1942, consisted of an L-shaped opencut about 25 feet in each dimension. Several tons of beryl are said to have been produced, though no exact record is available.

C-87, Beryl Feldspar Mine, Feldspar, Mica, Beryl,
Unorganized District, Custer County

The Beryl is a full-sized, unpatented lode claim just east of the Put claim and south of the Big Smoke No. 1. It is located 6 miles south of Keystone in secs. 23 and 26, T. 2 S., R. 6 E. just south of the county line. It is owned by Consolidated Feldspar Corp., who acquired it by purchase from Jesse Harris of Custer.

A large pegmatite mass strikes northwest and dips to the southwest. A thin selvage zone contains mica and a little beryl. The center contains segregations of potash feldspar.

Development consists of a large cut in the southwest side of the dike and a smaller cut on the northeast side. The property has been worked for feldspar, and some beryl has been produced as a byproduct. According to reports, most of the feldspar has come from the southern pit but most of the beryl from the northern pit.

Ref: 30, pp. 43-44.

C-88, Big Chief, Feldspar, Mica, Beryl,
Unorganized District, Pennington County

The Big Chief lies on an unpatented, full-sized claim about 5-1/2 miles southeast of Keystone. It is in the northeast corner sec. 22, T. 2 S., R. 6 E. It was formerly owned by the Otho Power & Development Co. and is now held by J. Arthur Johnson of Glendale, S. Dak.

There are two large pegmatite masses on the property that have an easterly strike. On the upper, or southern, dike a cut 30 feet wide and 30 feet deep exposes a 20-foot face that yielded about 36 percent good-quality "blue" feldspar. The lower, or northern, dike is exposed by a keystone-shaped cut 60 feet high, 60 feet wide at the top, and 40 feet at the bottom. An exploration drift 80 feet long has been driven from the center of the face on the lower dike.

Consolidated Feldspar Corp. shipped considerable feldspar from the property in the 1930's. According to reports, about 5 tons of beryl was produced incidental to the feldspar of which 3 tons was stolen.

Ref: 30, p. 44.

C-89, Big Shot, Feldspar, Beryl,
Unorganized District, Pennington County

The Big Shot prospect lies on an unpatented, full-sized lode claim 1/2 mile southwest of the Plate lode, probably in the NW1/4 sec. 7, T. 2 S., R. 6 E. It is held by location by Elmer Harris and Ed Young.

This is reported to be a large pegmatite dike containing mica, feldspar, and beryl. Beryl crystals up to 3 or 4 inches in diameter have been observed.

There is no record of development or production.

C-90, Confidence, Feldspar, Mica,
Keystone District, Pennington County

The Confidence No. 1 lode lies in Greyhound Gulch about 1 mile east of the Etta mine. It is in the SE1/4NE1/4 sec. 16, T. 2 S., R. 6 E. Stratton Brothers of Keystone, S. Dak., are the owners.

According to Guiteras, this lode is on a pegmatite dike that contains blocky feldspar, quartz, and mica. The feldspar is iron stained and has inclusions of mica but none of tourmaline.

Development consists of a cut 50 feet long, 10 feet wide, and 20 feet high on the face. Three or four carloads of feldspar are reported to have been shipped to Denver 15 or 20 years ago. There is no record of subsequent production.

Ref: 30, p. 26.

C-91, Dan Patch, Feldspar, Mica, Beryl,
Keystone District, Pennington County

The Dan Patch group consists of four unpatented lode claims. They were located in 1905 by S. T. and J. D. Andrews and were bought by the Consolidated Feldspar Corp. of Trenton, N. J., in 1940. They are situated in the NE1/4 sec. 7, T. 2 S., R. 6 E. about 2 miles southwest of the Keystone Post Office.

The Dan Patch is a pipelike body that plunges steeply southeast. In section, it is about 160 feet in a northwest direction and 150 feet in a northeast direction. The main mass is coarse microcline-perthite, intergrown with massive quartz, albite, and muscovite. The muscovite forms books of irregular distribution. Beryl, columbite-tantalite, and sphalerite occur with the muscovite. Beryl crystals are associated with massive quartz and muscovite. Some mica occurs around the margins of the mass.

Most of the mica is scrap, but some sheet mica has been produced. The beryl is white and often occurs in large crystals. One is reported to have produced 26 tons in 1945.

Development has been by a single large open pit on the Dan Patch No. 3 claim. Through January 1939 to November 1, 1942, the Dan Patch had produced (shipped) 6.29 tons of beryl, 11,549 tons of feldspar, 128 tons of scrap mica, and 20 tons of cutting mica.

Ref: 22, p. 163; 30, p. 25.

C-92, Dewey Mine (M. S. 1699), Mica, Spodumene, Feldspar,
Unorganized District, Pennington County

The Dewey mine is on a 10-acre patented claim in the NE1/4 sec. 17 and adjacent to part of sec. 8, T. 2 S., R. 5 E., 1-1/2 miles northwest of Harney Peak.

The Dewey pegmatite strikes N. 60° E. and dips 45° northwest. It has a length of approximately 300 feet and an average thickness of 20 feet. The interior of the dike consists of quartz-perthite pegmatite. Some spodumene is present near the east end of the dike. A mica zone up to 5 feet in thickness occurs along the hanging wall.

Development and mining have been by opencuts and two shallow shafts. Mica has come from an opencut along the hanging wall, and an opencut near the eastern end of the outcrop has produced potash feldspar and spodumene.

Partial production records are as follows:

1927 - 40 tons spodumene
1937 - 40 tons spodumene
1943 - 861.50 pounds untrimmed punch mica
    1,799.61 pounds small and large sheet mica
    Small, but unrecorded, production of beryl and feldspar

C-93, Dike (Dyke), Feldspar, Mica Amblygonite,
Unorganized District, Pennington County

The Dike consists of 1 unpatented, full-sized lode claim 3 airline miles southeast of Keystone in sec. 21, T. 2 S., R. 6 E. It was purchased from the Reinbold Metallurgical Co. in 1935 by Ralph A. Smith of Custer. It was subsequently worked under lease and finally sold to John Fisher of Custer in 1944.

Original from THE OHIO STATE UNIVERSITY

The Dike pegmatite is pear shaped, with its big end to the northeast. In plan view it is roughly 200 by 120 feet, with the long axis trending northeast. The mass is well zoned, with a 1- to 2-inch border zone, a 15- to 30-foot wall zone of plagioclase-quartz-muscovite, an intermediate plagioclase-perthite-quartz-spodumene zone, and a quartz-spodumene core. The spodumene zone contains book mica, beryl, amblygonite, and columbite-tantalite. Muscovite books up to 2 feet across, spodumene crystals up to 10 feet in length, and beryl crystals 3 feet in diameter and 6 to 8 feet long give an idea of the maximum crystal sizes attained in the central part of the mass.

Development has been by an opencut 120 by 90 feet in diameter and up to 65 feet deep and an inclined shaft connected to a glory hole in the bottom of the pit.

Production has included spodumene, feldspar, beryl, amblygonite, and mica. Through 1936-44 the mine had produced 209.81 pounds sheet mica, 786 pounds untrimmed punch, between 40,000 and 60,000 pounds of scrap mica, 136.46 tons of spodumene, 140 tons of amblygonite, 68.8 tons of beryl, and 6,125 tons of feldspar.

Ref: 7, p. 51; 30, pp. 26-27.

C-94, Edison Mine, Spodumene, Mica,
Keystone District, Pennington County

The Edison mine is located on the Sitting Bull, Bull Con, Hector fraction, and Gold Star claims in the SE1/4 sec. 9 and adjacent parts of sec. 16, T. 2 S., R. 6 E. It is operated under lease from the T. A. Edison estate by the Lithium Corporation of America.

Two pegmatites carry spodumene and other economically important minerals. The Edison, or Sitting Bull, pegmatite is irregular, with the long axis extending N. 25° W. It appears to be formed of four or more coalescing pegmatites. In each there is a wall zone of albite-quartz-muscovite pegmatite and an inner core of quartz-spodumene-albite rock. Minor minerals in the core include muscovite, columbite-tantalite, and apatite. Spodumene crystals range up to 8 feet in length, and vary from fresh to highly altered. The Bull Con dike, about 450 feet north of the Edison, is similar in form, structure, and mineralogy.

The two dikes were opened as spodumene prospects by David I. Swanzy in 1917-18. Extensive surface and underground mining has been carried on since 1943. An exploration program by the Bureau of Mines in 1944 resulted in 12 diamond-drill holes on the Edison and 1 on the Bull Con, for a total length of 2,114.5 feet of test holes. A mill for recovering finely ground spodumene by heavy-medium separation was built in 1949 and is still in operation.

Production has consisted primarily of spodumene, with minor quantities of feldspar, beryl, mica, and columbite-tantalite. Partial production figures are as follows:

1917-18	- spodumene
1943	- spodumene, 714.81 tons
1944	- spodumene, 1,422.13 tons

Ref: 7, table 5; 30, p. 27; 37, p. 128.

Original from THE OHIO STATE UNIVERSITY

C-95, Etta, (M. S. 429, 430), Spodumene, Feldspar, Mica, Keystone District, Pennington County

The Etta group consists of 2 patented lode claims, the Etta and Ferguson, 1 mile southeast of Keystone in the NW1/4 sec. 16, T. 2 S., R. 6 E. It is owned by the Maywood Chemical Works, formerly the Standard Essence Co. of Maywood, N. J. It was originally one of the principal tin properties of the Harney Peak Co.

The Etta pegmatite is a steeply dipping pipelike body, rudely elliptical in plan view, with horizontal dimensions of about 250 by 175 feet. Originally the pegmatite formed a topographic knob, but successive mining operations by opencut, glory hole, and underground methods, have reduced its volume greatly. An outer zone of pegmatite 5 to 15 feet thick consists of plagioclase-quartz-muscovite pegmatite. An intermediate zone is quartz-spodumene rock with some albite. Spodumene crystals nearly 50 feet in length have been noted; the average is perhaps less than 10 feet. A central core consists almost entirely of quartz.

The Etta was regarded as a prime tin prospect in 1883, and a mill for its recovery was built by the Harney Peak Tin Mining, Milling, & Manufacturing Co. After a short mill run in 1886, the mine lay idle until Reinbold shipped 30 tons of spodumene for experimental purposes in 1898. Roughly 1,200 tons of spodumene was shipped between 1898 and 1905. The Standard Essence Co. leased the mine in 1905 and bought it from the receivers of the Harney Peak Co. in 1908. It has been operated almost continuously ever since, producing spodumene, feldspar, mica, beryl, columbite-tantalite, and cassiterite.

Ref: 7, table 5; 12, pp. 240-244; 30, pp. 28-29.

C-96, Eureka, Feldspar, Mica, Unorganized District, Pennington County

The Eureka is an unpatented, full-sized lode claim, held by location by George Madill and William Graham of Keystone, S. Dak. It is located about 2-1/2 miles up Iron Creek from Glendale just north of the center of the south line of sec. 15, T. 2 S., R. 6 E.

The claim covers a pegmatite dike about 350 feet in length and 50 to 120 feet in width. The dike strikes east-west and is essentially vertical. It appears to plunge to the east at a low angle. There is a vertical range of 120 feet between the highest and lowest outcrops. The main part of the dike is of quartz and microcline perthite with a little tourmaline. Green glassy beryl, in crystals up to 3 inches in diameter, is associated with quartz, cleavelandite, and muscovite near the outer margins of the dike. Some of the mica is of sheet quality.

Development began in 1943 as a series of small test pits along the eastern end of the dike.

C-97, Ferguson, Feldspar, Beryl, Unorganized District, Pennington County

The Ferguson lode claim covers a pegmatite dike located in the NW1/4 sec. 14, T. 2 S., R. 6 E about 1/2 mile northwest of the Wood Tin lode, and 4 miles east-southeast of Keystone.

A pegmatite dike, located near the top of a ridge, has been traced for about 120 feet. It is 40 feet wide and is nearly vertical. Minerals noted during an examination in 1942 include microcline, albite, quartz, muscovite, columbite, triphylite, cassiterite, apatite, tourmaline, and a few beryl crystals.

The only recorded production record indicates that Consolidated Feldspar Corp. purchased 0.52 tons of beryl from this property in 1940.

C-98, Formoso, Mica,
Unorganized District, Custer County

The Formoso claim is located in the SW1/4 sec. 25, T. 2 S., R. 5 E. It was located on April 26, 1946, by Wilma Dunstan and Ethel Smith of Custer.

The claim covers part of a large mass of pegmatitic granite, which is cut by narrow pegmatite dikes. Mica-rich zones up to 12 inches in width are reported to carry ruby mica in books up to 5 inches in diameter.

Development has been by a few small prospect pits, and no production has been recorded.

C-99, Gap Lode, Mica, Feldspar,
Unorganized District, Pennington County

The Gap lode is near Sylvan Lake in the NE1/4 sec. 19, T. 2 S., R. 5 E. It is held by Francis Michaud and W. W. Wright and was operated under lease in 1943 and 1944.

Two pegmatite dikes, 135 feet apart, cut the Harney Peak granite. The Gap pegmatite strikes N. 70° E. and dips 80° north. It has an overall length of about 600 feet. The southwest 250 feet is split into 2 separate dikes 6 to 10 feet wide; the main dike to the north averages 18 feet in width. Muscovite occurs in a 2- to 3-foot wall zone with quartz, plagioclase, and perthite. The central part of the dike is perthite-quartz pegmatite, with perthite crystals up to several feet in length. The second or northern dike is similar in structure, but averages only 8 feet in thickness. Development has been by three trenchlike open pits on the Gap dike and one on the other pegmatite.

Mica and feldspar have been produced. The mica is a ruby variety in books up to 15 inches in diameter and 3 inches thick. Much of it is air stained and clouded by inclusions. Total production figures are not available. In 1943, Michaud, Duncan, and Frye sold 1,255.72 pounds of small and large sheet to the Colonial Mica Corp. Custer Mining Account operated the property for 1 month in 1944 and produced a small quantity of mica.

C-100, Gilt Edge, Mica,
Unorganized District, Pennington County

The Gilt Edge pegmatite dike is 3.6 miles southeast of Keystone, probably in the W1/2 sec. 9, T. 2 S., R. 6 E. It is 0.6 mile east of the Phillips and Phyllis (Watson) feldspar mine. Sam J. Hardin of Aberdeen, S. Dak., is listed as owner.

The pegmatite strikes N. 20° E. and is about 12 feet thick. Minerals observed during an examination in 1942 include pink microcline, muscovite, and a little quartz and graphic granite, all iron stained. No beryl was observed.

Development at that time consisted of an opencut extending up the hillside along the strike of the dike for about 100 feet.

A production of 0.1 tons of beryl is recorded before 1942.

C-101, Occidental, Tin,
Unorganized District, Custer County

The Occidental lode is one of a group of four lode claims, comprising M. S. 1323, on the line between secs. 23 and 26, T. 3 S., R. 3 E.

The Occidental lode was an early day tin prospect. The property is frequently cited in the literature because of some analytical work done by Dr. W. P. Headden of the Dakota School of Mines in 1888.

Analyses of cassiterite from this dike assayed 96.42 percent SnO_2 or 75.66 percent metallic tin.

Although it is listed in Headden's report as a mine, it was apparently only a prospect, and there is no record of any production.

Ref: 8, p. 141; 44, p. 65; 68, pp. 107-108.

C-102, Henry Tin, Tin, Beryl,
Keystone District, Pennington County

The Henry Tin is a 10-acre patented lode claim within the town of Keystone on the south side of Battle Creek opposite the mill of the Consolidated Feldspar Corp. It is situated in the NW1/4NE1/4 sec. 8, T. 2 S., R. 6 E. The Rapid Investment Co. owns a two-thirds and the Rapid City Lumber Co. a one-third interest in the property.

The claim covers a pegmatite dike originally staked as a tin prospect. Recent examination has revealed a few crystals of beryl on the outcrop.

There has been no development and no production from the property.

C-103, High Climb, Feldspar, Beryl, Mica, Amblygonite,
Unorganized District, Custer County

The High Climb is a single unpatented lode claim of approximately 20 acres. It is in the NE1/4 sec. 27, T. 2 S., R. 4 E. about 6 miles north of Custer. Gladys Wells and Fred Heidepriem of Custer, S. Dak., are listed as owners.

The High Climb pegmatite is an irregular-shaped intrusion striking roughly north-south and dipping westward. It is essentially conformable with the enclosing schists. Outcrops are poor, but the pegmatite appears to be roughly 500 feet long and up to 100 feet in width. The pegmatite is well zoned. Of economic interest are an intermediate zone of cleavelandite-quartz-muscovite-amblygonite and a quartz-spodumene core.

The pegmatite was originally opened up about 1932 by two high cuts from the southeast. In 1937 a new opening, 25 feet lower, was made from the northwest. This has extended into a large open pit which cuts across the dike for over 100 feet at right angles to the strike.

The intermediate zone has been the source of the amblygonite, beryl, scrap mica, columbite, and feldspar. The spodumene is too highly altered to be of value. Production records from 1932-41 are as follows:

Amblygonite	- 7 40-50 ton cars, 1934-38
Beryl	- 58 tons, 1932-40; 2 tons, 1941
Mica	- 100 tons (including about 150 pounds punch and plate)
Feldspar	- 150 to 180 tons
Columbite	- 100 pounds

Ref: 23; 30, pp. 47-48.

C-104, Hugo Mine (M. S. 1748), Feldspar, Mica, Beryl, Keystone District, Pennington County

The Hugo mine is located on the Spodumene patented lode claim, owned by Hugh Reinbold, and operated under sublease to the Consolidated Feldspar Corp. since 1929. It is in secs. 8 and 17, T. 2 S., R. 6 E. 1 mile south of Keystone. The claim covers a large part of the ground formerly included in the Sarah group (see C-84, p. 66).

The Hugo pegmatite is roughly oval in plan, with a long dimension of about 700 feet and a maximum short dimension of 400 feet. It strikes N. 20° W. and dips steeply to the east. Studies by the Federal Geological Survey indicate that the pegmatite is well zoned. In general, there appears to be a wall zone containing sheet muscovite and beryl, an intermediate zone containing potash feldspar and scrap mica, an inner zone containing amblygonite with feldspar and mica, and a core containing spodumene in quartz.

Development has been by opencuts on several levels and two haulage tunnels, which connect to the opencuts by means of raises.

Production has included feldspar, amblygonite, spodumene, sheet and scrap mica, beryl, and columbite-tantalite. Production figures are not known in detail. Guiteras gives the feldspar production before 1938 as 200,000 tons. Spodumene was produced only in the early days. Total amblygonite production was estimated in 1942 as 1,300-1,500 tons. Mica production 1929-42 is given as 880 tons, including 80 tons of crude sheet. Beryl production through 1943 was 22.3 tons.

Ref: 7, table 5; 30, pp. 24-25; 35.

C-105, Jumbo Lode, Feldspar, Mica, Beryl, Unorganized District, Custer County

The Jumbo is 1/2 mile south of the Iron Mountain road a short distance west of its junction with the Spokane-Keystone road. It lies in either sec. 33 or 34, T. 2 S., R. 5 E. Owners are listed as Kenneth and Godfrey Spring of Custer, S. Dak.

The claim covers a large pegmatite dike. Minerals reported include microcline, quartz, muscovite, tourmaline, graphic granite, some biotite, and a little beryl. No beryl was visible when the dike was inspected in 1942.

Development consists of two small opencuts in the side of the pegmatite. No production is reported.

C-106, Josie, Mica, Unorganized District, Custer County

The Josie lode is an unpatented claim lying south of the Iron Mountain Road in the NE1/4 sec. 34, T. 2 S., R. 6 E. It is held by location by John Delaney of Custer, S. Dak.

A pegmatite dike 100 feet long and up to 40 feet in width cuts the Harney Peak granite. The dike strikes northwest and dips to the southwest. A wall zone of perthite-quartz-muscovite is well developed along the hanging wall and is less conspicuous along the footwall. It consists of book mica, albite, garnet, biotite, apatite, and a little beryl. The core of the dike is perthite-quartz.

Development consists of an opencut 50 feet long and from 4 to 20 feet in depth. Much of the work is very old and probably dates back to tin-prospecting days.

Between March 1943 and January 1944, 328.6 pounds of small sheet mica was sold to Colonial Mica Corp. Most of it was of inferior quality because of air and mineral staining.

C-107, King Lithia Prospect, Lithium, Beryl,
Unorganized District, Pennington County

The group includes the King lode, formerly the Equality, and the King fraction. It is about 1 mile south of Glendale in the SW1/4 sec. 15, T. 2 S., R. 6 E. and is adjacent to the Pink Elephant. J. Arthur Johnson of Glendale holds the claims by location.

The King pegmatite consists of a narrow dike 200 to 300 feet long, which strikes N. 80° W. and dips 21° northeast. It is developed by an open trench parallel to the strike along the south side of the dike. The trench is 70 feet long, 10 to 12 feet wide, and up to 10 feet in depth. Near the center of the trench an incline 30 feet long follows down the dip of the dike. Near the east end of the trench, a core 3-1/2 feet thick consists of spodumene with some feldspar, amblygonite, and quartz. West of the shaft the pegmatite consists of quartz, cleavelandite, microcline, and muscovite, with some spodumene. A 1-foot quartz zone overlying the spodumene-rich zone at the east end carries beryl crystals.

A smaller but thicker pegmatite a few feet below the King dike carries spodumene in small, scattered crystals.

An opencut in a dike on the King lode fraction also exposes pegmatite rich in small crystals of spodumene. Other pegmatites on the fractional lode have not been explored.

Production figures are approximately as follows:

Spodumene - less than 100 tons
Beryl - 8 tons shipped 1939-42
Amblygonite - less than 10 tons

C-108, King Mica (White Cap) (Primer), Feldspar, Beryl, Mica,
Keystone District, Pennington County

The King Mica lode is about 1/2 mile east of the Etta mine in the NW1/4NE1/4 sec. 16, T. 2 S., R. 6 E. It is owned by Friend G. Robertson and has been operated under lease.

The White Cap pegmatite has an observed length of 350 feet, and a width of 25 to 35 feet. It strikes N. 47° to 60° W. and dips 60° northeast. It appears to be conformable with the enclosing mica schist.

The dike shows distinct mineral zones. The core, 15 to 25 feet in thickness, is potash feldspar with some quartz and amblygonite. An intermediate zone consists of perthite, quartz, muscovite, lithiophilite, and beryl. A wall zone 1 to 2 feet thick consists of muscovite-rich pegmatite, with some quartz, phosphate minerals, and albite. This is separated from the country rock by a thin marginal zone of fine-grained plagioclase-quartz pegmatite.

An opencut 25 feet wide has been driven into the dike from the southeast end and the feldspar core largely mined out. A second opencut 70 by 15 by 15 feet is present on the northwest side. Feldspar is the principal product, with mica and beryl produced as byproducts. Minerals shipped or stockpiled, 1939 to October 31, 1942, are as follows:

Year	Feldspar, tons	Beryl, tons	Mica, tons
1939......	360	2.5	8
1940......	1,295	4.0	15.52
1941......	1,523	3	17.12
1942......	777	4	17.29

Ref: 7, table 5; 30, pp. 27-28.

C-109, Lake (Lakeside), Mica,
Unorganized District, Custer County

The Lake mica prospect in the SW1/4 sec. 29, T. 2 S., R. 5 E. is owned by Mrs. Gladys Wells of Custer, S. Dak.

Three pegmatite dikes cut a prominent outcrop of Harney Peak granite, which lies a few hundred yards east of Sylvan Lake. The central dike strikes N. 50° E. and dips 80° northwest; it is 5 to 8 feet thick and may be traced for about 150 feet. The wall zones of the dike are up to 2 feet thick and contain considerable mica. The core contains plagioclase, quartz, perthite, muscovite, biotite, and tourmaline. Books of sheet mica are all in the core zone. Similar dikes occur 50 feet on either side of the main prospect but have not been exploited.

Development has been by opencuts and prospect pits on the middle and northernmost pegmatites. Most of the mica has come from a cut 50 feet long, 8 feet wide, and up to 40 feet deep at the face at the west end of the middle dike.

The mine was operated in 1943 by Mrs. Wells and later by L. H. Jeffries. Production of unclassified sheet mica in 1943 was 231.79 pounds. Of this total, Jeffries recovered 71.54 pounds from 1,700 pounds of crude mica.

C-110, Maderposson, Feldspar, Beryl,
Unorganized District, Pennington County

The Maderposson is a full-sized, unpatented lode claim located in 1941 and owned by Earl A. Madill of Keystone, S. Dak. It lies east of the Spokane-Keystone road, about 1 mile south of Iron Creek in sec. 23, T. 2 S., R. 6 E.

The claim covers a small pegmatite dike, which strikes essentially north-south, and has a width of 15 feet. A small amount of beryl was noted during an examination in 1942. Development at that time consisted of a single small exploration pit. There is no record of any production.

C-111, Maryland Lode (Olds Lode), Feldspar, Mica, Unorganized District, Custer County

The Maryland lode is 10 miles northeast of Custer, probably in the SE1/4 sec. 36, T. 2 S., R. 5 E. It is owned by James Shea.

According to Guiteras, a series of pegmatites cut the Harney Peak granite about 1/2 mile east of old C.C.C. Camp Remington. Near the north end of the claim, a shallow trench has followed a mica zone for about 100 feet along the strike. Some mica is reported to have been shipped before 1938. A dike near the center of the lode has feldspar exposed by a 30-foot cut across a dike, which trends roughly east-west. Near the south end of the property 2 dikes have been opened by 25- and 50-foot cuts, but both dikes are said to be too fine grained to permit economical hand sorting of the minerals.

No activity is reported at the property since Guiteras' visit in 1938.

Ref: 30, p. 58.

C-112, Monkey Lode, Feldspar, Beryl, Mica, Unorganized District, Pennington County

The Monkey lode is in Palmer Gulch in the NW1/4 sec. 17, T. 2 S., R. 5 E. It was operated in 1943 by Basil and Claude Canfield and Carl Pettit of Hill City, S. Dak.

A pegmatite dike about 15 feet thick is exposed for a length of at least 100 feet. It dips 35° northwest and strikes N. 80° E. The hanging wall is well exposed by erosion. The contact with the enclosing schist must have been very irregular. Along the wall, a zone of quartz-albite-muscovite pegmatite carries commercial mica and some beryl. The interior of the dike consists of coarse-grained quartz-perthite pegmatite.

Development is from open pits on the upper or hanging wall surface of the dike. During 1943 a total of 4,830.5 pounds of punch and 1,811.47 pounds of sheet mica was produced. Most of the mica is heavily air stained. Colonial Mica Corp. also purchased 2,217 pounds of beryl from the Monkey lode in 1943. There is no record of subsequent production.

C-113, New England, Feldspar, Beryl, Unorganized District, Pennington County

The New England is an unpatented, full-sized lode claim. It lies about 1/2 mile northeast of the Iron Mountain Road 7-1/2 miles by road south of Keystone. It is held by location by Vincent Cordes of Keystone, S. Dak.

The claim covers a large pegmatite mass, which strikes westward for about 350 feet, then southwestward for about the same distance. It has a width of at least 200 feet at its eastern end. Minerals noted during a brief examination in 1942 include fine-grained pegmatite, graphic granite, pink quartz, white quartz, muscovite and biotite (frequently intergrown), microcline, tourmaline, and beryl. The beryl was limited to a few small crystals found in two places.

Development at the time of visit consisted of two small side-hill cuts. No production has been recorded.

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C-114, November Mine, Feldspar, Mica, Unorganized District, Custer County

The November pegmatite mine is in the NE1/4 sec. 32, T. 2 S., R. 5 E. 5 miles northeast of Custer.

Mica occurs in a wall zone 1 to 4 feet thick, which is composed of plagioclase, quartz, and muscovite. The core of the pegmatite is perthite and quartz.

In 1943-44 the mine was operated by Harold Eyrich and Monte Humphreus of Custer. Mining was by an opencut extending westward parallel to the strike. The feldspar core was largely removed and the mica zone exposed on both the hanging and foot walls. Feldspar and sheet and scrap mica have been produced.

Production in 1943 was 1,880.59 pounds of sheet mica and an unrecorded amount of scrap mica and feldspar. Feldspar and scrap only were produced in 1944.

C-115, Old Mike (Great Northern), Mica, Beryl, Unorganized District, Custer County

The Old Mike mica mine is about 5-1/2 miles north of Custer in the NW1/4 sec. 2, T. 3 S., R. 4 E. It is owned by Edward Wray of Evanston, Ill., and was operated during World War II by Mineral Mills, Inc.

The Old Mike pegmatite is a lenticular mass 350 feet long and up to 50 feet in thickness. It strikes northwest and is nearly vertical. Several irregular offshoots or stringers extend into the country rock. The Federal Geological Survey recognizes five zones within the pegmatite. Nearly all sheet and scrap mica has been recovered from a wall zone 1 to 20 feet in thickness. The majority of the beryl and tantalite has come from an intermediate zone of cleavelandite-quartz pegmatite.

Development has at various times been by drifts, shaft, open pits, and glory holes. Many of the old workings have been backfilled.

A second pegmatite, 75 feet east of the north end of the Old Mike, is intermittently exposed over an area 450 by 150 feet but has not been developed.

The Old Mike has been a producer of mica during every period of mica mining since its location about 1880. No production figures before 1941 are available. The following figures cover production from July 16, 1941 to June 1, 1945:

Sheet mica	-	9,776	pounds
Punch mica	-	49,470	pounds
Scrap mica	-	1,238,999	pounds
Beryl	-	19.75	tons
Tantalite	-	200	pounds

There has been no activity since 1945.

Ref: 7, pp. 26, 40, 44, 48, 68, 95, fig. 16; 30, p. 66; 36; 56; 62, pp. 299-300; 63, pp. 393-394.

C-116, Oreville Spar, Feldspar, Mica, Unorganized District, Pennington County

The Oreville Spar mica mine is in the SE1/4 sec. 22, T. 2 S., R. 4 E. about 1 mile southwest of Oreville. It is held by Gladys Wells and Fred Heidepriem of Custer, S. Dak., and has been operated under lease.

The ore body is a complex pegmatite, apparently intruded into the crest of a steeply plunging fold in the pre-Cambrian schists. The outcrop consists of two lobes, representing the flanks of the fold. The south limb strikes northwest and dips southwest. The northern limb strikes northeast and dips northwest. The limbs are, respectively, 150 and 100 feet in length; the thickness is about 30 feet. Minerals of commercial interest include mica, feldspar, amblygonite, beryl, and cassiterite.

Aside from small prospect pits apparently made during tin prospecting days, the development consists of a single large opencut 100 feet long, up to 30 feet deep, and 10 to 15 feet wide. Sheet mica occurs in books up to 4 inches across. A total of 305.81 pounds of sheet mica was produced by Lewis Collingwood and associates during 1944. There is no record of the sale of any beryl, amblygonite, or feldspar. If any has been produced the amounts are minor.

C-117, Juniper Mine, Gold, Silver, Keystone District, Pennington County

The Juniper gold mine is near the center of sec. 5, T. 2 S., R. 6 E. about 1 mile northwest of Keystone, S. Dak.

The Juniper was located in 1884 by a prospector named Phinney. Before 1900 it was acquired by John Snowie and W. H. Graham. Oxidized ore from an open pit and from a shaft was taken to a custom mill in Keystone in 1903. There was no activity then until 1934, when George Perkins unwatered the mine and did some promotional and development work. The mine was examined by F. C. Lincoln at that time. The present operators, Southern Hills Mines, Inc., began operations in 1948. Development, shaft sinking, and mill construction continued through 1950, when the mill was completed and operation started.

The country rock, consisting of schist and quartzite of pre-Cambrian age, strikes north-northwest, and dips steeply to the east. An irregular quartz vein lies in a fault along the hanging wall of a shear zone, which is essentially parallel to the bedding. The shear zone is irregularly mineralized, with the best ore apparently along the hanging wall side. This zone is about 60 feet wide at the surface and 45 feet wide between the 100- and 200-foot levels. The ore is quartz containing gold associated with pyrite and arsenopyrite.

Development consists of an old open pit, several hundred feet of irregular drifts, stopes and winzes near the surface, and a new operating shaft 200 feet deep from which 400 feet of drifts and crosscuts have been driven on the 100-foot level and 300 feet of drifts and crosscuts have been driven on the 200-foot level.

Early production records are not available, and data on the new operation have not been released. In May 1951 the mill was treating about 30 tons of ore a day.

Ref: 1, pp. 107-109.

C-118, Peerless (M. S. 468-70), Mica, Beryl, Keystone District, Pennington County

The Peerless property, including the Monarch, the Monitor, and the Protector patented lode claims, is largely in the E1/2 sec. 8, T. 2 S., R. 6 E. but extends slightly into sec. 9. The property is owned by the Keystone Feldspar and Chemical Co. of Chicago, Ill., which has operated it almost continuously since purchasing it from the Reinbold Metallurgical Co. in 1924.

The Peerless pegmatite is in the form of a thick lens that plunges northeast at 50°. The outcrop strikes northwest and is about 465 feet long and 275 feet wide.

Most of the mining has been in a 60- to 80-foot zone of cleavelandite-quartz-muscovite pegmatite, which overlies the wall zone on the footwall side. Beryl, in crystals up to 12 inches in diameter, as well as cassiterite and columbite, are present in the zone.

Development has been by opencuts, drifts, and a glory hole. A diamond-drilling program, followed by experimental mining, was undertaken by the Federal Bureau of Mines and the Federal Geological Survey in 1950-51.

The Peerless has produced scrap and sheet mica, amblygonite, beryl, soda spar, lithiophilite, columbite, and cassiterite. Incomplete figures show the following production:

Amblygonite - some before 1924; 1924-42, 60 tons
Columbite - small quantities
Cassiterite - approximately 1 ton before 1942
Mica - scrap not recorded
- sheet 1943-45, 239.3 pounds
Beryl - 1918-42, 382.24 tons
Feldspar - not recorded

Ref: 44, p. 29; 61, 1917, 1918, 1922, 1924.

C-119, Pink Elephant Beryl Prospect, Beryl, Mica, Keystone District, Pennington County

The Pink Elephant lode, owned by A. L. Madill and Jack Osborne of Keystone, S. Dak., is 1 mile south of Glendale, adjacent to the King Lithia prospect. It probably is in the SW1/4 sec. 15, T. 2 S., R. 6 E.

The ore body is an elongated pegmatite that crops out along a ridge above Elk Creek. Minerals observed by F. C. Lincoln during a brief examination in 1942 include microcline, quartz, muscovite, and beryl. The beryl appears in small, scattered segregations. Development at the time of the examination consisted of five small opencuts and a shallow shaft. Production through 1942 totaled 1,100 pounds of beryl.

C-120, Plate Mica Prospect, Mica, Beryl, Keystone District, Pennington County

The Plate is an unpatented full-sized lode claim, situated in the SW1/4 sec. 6, T. 2 S., R. 6 E. on the south side of Battle Creek. It was located by E. C. Harris and V. T. Leaver in August 1941 and lies about 1 mile south of the Bob Ingersoll mine.

The claim covers two parallel pegmatites that strike S. 55° W., and dip northwest. Outcrops expose the hanging wall side over a vertical range of 200 feet. A mica-bearing wall zone up to 6 feet in thickness contains beryl. The mica is mostly scrap quality, but some punch-sized books are present. Some columbite-tantalite has been noted.

Development has been by two small cuts. Several tons of scrap and punch mica were produced by the end of 1942, and 400 pounds of beryl was stockpiled. In 1943 about 500 pounds of crude mica and a few pounds of beryl were produced by Harris.

C-121, Ponca Group (M. S. 1110), Feldspar, Mica, Beryl, Keystone District, Pennington County

The Ponca group consists of two 10-acre lode claims located in 1898 by Frederick Gardner and patented in 1902 by the Harney Peak Tin Mining, Milling, & Manufacturing Co. The claims were purchased in 1941 by Alton Leach and J. R. Jurisch of Keystone, S. Dak. The property is on the north side of Iron Creek 1/2 mile east of the bridge on the Spokane-Keystone road in the center of the W1/2 sec. 14, T. 2 S., R. 6 E.

The deposit is a vertical pegmatite dike about 300 feet long and 50 feet wide that strikes N. 60° W. Minerals observed are quartz, microcline, muscovite, tourmaline, and beryl. Although no cassiterite is visible in the outcrop, the dike originally was located as a tin prospect.

Development has been by small opencuts and by an adit 30 feet or more in length.

Production through 1943 included 40 tons of feldspar, 4 tons of scrap mica, and several hundred pounds of beryl.

C-122, Put, Beryl, Unorganized District, Custer County

The Put is a full-sized unpatented lode claim, which lies just west of the Beryl lode and south of the Big Smoke No. 2 lode. It is 6 miles south of Keystone in secs. 23 and 26, T. 2 S., R. 6 E. The property is owned by the Consolidated Feldspar Corp. of Trenton, N. J., which purchased it from Jesse Harris of Custer.

The Put deposit is a small pegmatite knob, closely associated with other similar pegmatite outcrops. Minerals present include microcline, quartz, mica, columbite, beryl, albite, tourmaline, and garnet.

Development is by an opencut into the hillside. In 1942 this cut was about 17 feet square, and exposed a face 34 feet high. Beryl produced during assessment work in 1942 amounted to about 1/2 ton from 20 tons of rock. Small prior production is not recorded.

C-123, Queen Claim, Beryl, Feldspar, Keystone District, Pennington County

The Queen is a full-sized, unpatented lode claim on Iron Creek 1/2 mile south of Glendale in sec. 15, T. 2 S., R. 6 E. It is owned by A. L., George, and Waldo Madill and Jack Osborne.

The Queen claim covers two pegmatite dikes. The principal pegmatite is nearly vertical and is 30 feet wide and 150 feet long. It strikes S. 55° E. Minerals observed by F. C. Lincoln during an examination in 1942 include yellow-stained microline, scrap mica, a little quartz, lithiophilite-triphylite, beryl, and tourmaline.

Development at the time of the examination consisted of a 15 by 15-foot hillside cut 25 feet high. An adjacent dike, similar to the main dike, has not been prospected.

Production in 1937 was 2,700 pounds of beryl and 48 tons of potash feldspar.

C-124, Sitting Bull, Beryl, Mica,
Keystone District, Pennington County

The Sitting Bull group consists of one small-sized patented lode claim and four adjacent claims. It is 1 mile northwest of Keystone in the SW1/4 sec. 5, T. 2 S., R. 6 E. The property is owned by the Black Hills Keystone Corp., of which William K. Wallace, New York, N. Y., is president.

The Sitting Bull pegmatite is a lenticular body that strikes N. 25° W. and dips about 70° northeast. It is about 160 feet long and has a maximum thickness of 40 feet.

Development consists of an opencut along the northeast side of the pegmatite. This cut, approximately 100 feet long and up to 20 feet wide, has been excavated in the wall zone on the hanging wall side. Production from this cut, between 1929 and 1942, consisted of 15 tons of beryl, 75 tons of scrap mica, and 25 tons of soda spar.

C-125, Sky Lode, Lithium,
Unorganized District, Custer County

The Sky lode is located near the center of the E1/2 sec. 27, T. 2 S., R. 4 E. about 5-1/2 miles north-northeast of Custer, S. Dak. It is situated on the east side of Tenderfoot Gulch 1/2 mile east of the Chicago, Burlington, & Quincy Railroad and 500 to 700 feet above it.

The deposit is a small pegmatite dike in the Harney Peak granite. Minerals observed by J. P. Gries at the time of an investigation in 1942 include spodumene in altered "logs", quartz, feldspar, a little mica, and black tourmaline. No beryl was seen.

The pegmatite is a prospect only and no production has been recorded.

C-126, Soda Spar (Mountain Lion), Feldspar, Beryl, Lithium, Mica,
Unorganized District, Pennington County

The Soda Spar mine lies on a full-sized, unpatented lode claim originally known as the Mountain Lion but was relocated by Friend C. Robertson in 1937. It is in sec. 22, T. 2 S., R. 6 E. about 5 miles by road southeast of Keystone between Glendale and Spokane.

The pegmatite has weathered to a knob about 300 feet long and 150 feet wide, which projects about 200 feet above the surrounding schist. The mass strikes N. 20° W.

Most of the pegmatite is fine grained, but near the south end a fracture in the main mass has been filled with coarse-grained pegmatite. This fracture filling, which strikes N. 45° E. and dips 10° to 75° northwest, is about 25 feet wide and can be traced for 150 feet. It probably connects to an inner zone of spodumene-bearing pegmatite, which is not well exposed by development work to date. Other minerals observed in the inner zone are quartz-microcline perthite, amblygonite, beryl, and lithiophilite.

Development consists of an opencut 87 feet long and 15 to 20 feet wide, which follows the filled fracture. The property has been operated under lease to several individuals. Production through 1942 includes 500 tons of feldspar, 12 tons of beryl, 18 tons of amblygonite, and 9 tons of scrap mica.

Guiteras (1940) also reported 3 tons of spodumene and 100 pounds of columbite-tantalite stockpiled on the dump.

Ref: 7, fig. 20, pp. 32, 68, 79; 30, pp. 56-57.

C-127, Star Lode, Lithium, Beryl,
Keystone District, Pennington County

The Star lithia mine is 1 mile west of Hayward on the Keystone Road in sec. 13, T. 2 S., R. 6 E. It is owned by Henry Nickels of Hayward and is currently under lease to Vincent Cordes of Keystone.

The Star mine is opened in a pegmatite that ranges from 10 to 20 feet in width and strikes N. 45° W. Minerals observed during an inspection in 1942 include amblygonite, beryl, columbite-tantalite, yellow lepidolite (probably muscovite), scrap mica, potash spar, lithiophilite-triphylite, and talc.

Development has been by an opencut 100 feet long through schist and pegmatite, a small drift, and a stope in the pegmatite. A 65-foot inclined shaft on the footwall has recently been sunk by Cordes.

Production includes 2 carloads of amblygonite shipped in 1907-8, as well as 5 or 6 tons of amblygonite mined but stolen during World War I and 400 pounds of beryl sold in Custer by Jack Johnson in 1941. Subsequent production is not available but is said to include 7 tons of beryl produced by Cordes while sinking the incline.

C-128, Tiger Lode, Lithium,
Unorganized District, Pennington County

The Tiger lode is about 4 miles east of Keystone. It was located in 1904 by John Moody and Andrew Gunnison and is now owned by W. W. Keyser of Rapid City, S. Dak.

The claim covers a small pegmatite in Algonkian schist. Minerals observed at the time of an investigation in 1942 included potash feldspar, amblygonite, beryl, columbite-tantalite, lepidolite, and spodumene.

About 2,300 pounds of amblygonite is reported to have been produced shortly after the discovery of the dike. There is no record of recent production.

C-129, Watson (Phillip and Phyllis Lodes), Feldspar,
Keystone District, Pennington County

The Watson feldspar mine, on the Phillip and the Phyllis lodes, lies 3 miles east of Keystone on the Hayward Road and is in the SE1/4 sec. 10, T. 2 S., R. 6 E. It is owned by Steve Watson and Basil Canfield.

The mine is opened in a pegmatite dike that consists primarily of iron-stained feldspar and quartz. A small amount of mica is present, and minor quantities of beryl and cassiterite have been noted.

The property has been operated intermittently to produce feldspar. Development consists of an opencut in the hillside about 30 feet wide and 100 feet long. An undetermined amount of feldspar has been shipped to the Consolidated Feldspar Corp. mill at Keystone.

Ref: 44, p. 27.

C-130, Western Feldspar, Feldspar, Unorganized District, Pennington County

The Western Feldspar lode is a 20-acre unpatented claim relocated October 20, 1938, by Andrew Miller and George W. Coats. It lies 3-1/4 miles southwest of Hill City in sec. 32, T. 1 S., R. 4 E.

A pegmatite dike on the property is 216 feet in length at the surface and has a maximum thickness of 18 feet. It strikes northeast and dips 75° to the west. On the hanging wall and footwall are 3 to 4 foot zones consisting of fine-grained feldspar, quartz, and mica with traces of cassiterite. The core, which is about 11 feet thick, contains feldspar, quartz, mica, and spodumene.

The dike has been developed by a series of cuts. These include a cut in the footwall schist at the north end, 3 cuts in pegmatite spaced along the strike of the dike, and a 25-foot shaft near the south end of the pegmatite. The largest cut crosses the pegmatite from wall to wall. It is 20 feet long, 6 feet wide, and 8 feet deep.

The dike probably was prospected for tin in the early days of the area but recently has been examined for feldspar and spodumene. No production is recorded.

C-131, Noble Mica (M. S. 1973), Mica, Unorganized District, Custer County

The Noble mica lode is 1/4 mile west of the Needles Highway in the center of the E1/2 sec. 32, T. 2 S., R. 5 E. It consists of one 20-acre patented claim, now lying within the boundaries of the Custer State Park.

The mine is developed in a small pegmatite dike in the Harney Peak granite. It ranges from 6 to 10 feet in thickness and can be traced for 70 feet along the strike. The dike strikes N. 80° W. and dips 30° to 50° northeast. Most of the dike material has been excavated to a maximum depth of 25 feet on the dip. Two zones have been distinguished. A wall zone 4 to 6 feet thick contains mica, plagioclase feldspar, quartz, and blocks of potash feldspar. The mica, which occurs in small books, is ruby mica heavily air stained and clouded with mineral inclusions.

Some work was done on the property before it was withdrawn from mining by ruling of the Park Board. In 1944 it was leased to Leon LaRue of Custer.

C-132, Old Jeff (Tin Reef), Tin, Unorganized District, Custer County

The Old Jeff group consists of 3 patented 10-acre claims about 5 miles northwest of Custer in sec. 10, T. 3 S., R. 4 E. These are the Tin Reef, the Great

Eastern, and the Custer M. S. 627-629 successively. (According to Ziegler's map, the Old Jeff is in the NW1/4 sec. 3, same township).

The deposit is a pegmatite dike about 15 feet thick that contains cassiterite. Both the pegmatite and the cassiterite are reported to be unusually fine grained. Except for the Tin Mountain mine southwest of Custer, this is the most southerly reported occurrence of cassiterite in the Black Hills.

The Old Jeff was one of the mines of the Harney Peak Tin Mining, Milling, & Manufacturing Co. Under the direction of Prof. M. C. Vincent, 2 samples of ore from this property, grossing 3,241 pounds, were shipped to England for testing in 1888. Captain Josiah Thomas examined the property for the Harney Peak Co. in 1892 and reported that his samples yielded 50 pounds of cassiterite to the ton.

No production is recorded from the property.

Ref: 8, p. 147; 65, p. 536.

C-133, Champion, Feldspar, Beryl,
Unorganized District, Pennington County

The Champion pegmatite is about 5 miles by road southeast of Keystone at the junction of two forks of Greyhound Gulch. It lies in sec. 16, T. 2 S., R. 6 E. The claim was located in 1939 by Mr. Champion; since his death in 1942, the property has been held by his widow.

The pegmatite is about 120 feet long and stands essentially vertical. The southern end of the dike strikes southeast and is about 25 feet wide. The northern third has a width of 15 feet and strikes nearly north. The east side is exposed over a vertical range of 40 feet. An outer zone, about 5 feet thick, consists of relatively fine-grained pegmatite with some mica and beryl. The central part contains coarsely crystalline iron-stained microcline, quartz, and some altered spodumene.

Development before Champion's death in 1942 consisted of an open face 60 feet wide and 40 feet high, extending about 4 feet into the dike. Production records are not complete. Apparently about 100 pounds of beryl, 100 tons of feldspar, and a small amount of scrap mica were produced. The feldspar was produced during the winter of 1941-42; no record was kept of previous production.

C-134, Fern Cliff Prospect, Tungsten,
Unorganized District, Custer County

The Fern Cliff tungsten prospect lies near the northeast corner of sec. 27 and extends into the adjacent part of sec. 26, T. 2 S., R. 6 E. It is about 6-1/2 miles southeast of Keystone and 3/4 mile north of Spokane. The property is owned by Friend C. Robertson, who owns an adjacent homestead.

Two quartz veins on the property contain tungsten minerals. Wolframite and scheelite occur in segregations in the quartz and are associated with pyrite below the zone of oxidation. Some ore is found in the adjacent schist country rock. The western vein strikes north, and ranges from 1-1/2 to 4 feet in width. The east vein strikes N. 30° W. and is about 2 feet thick. The two join to form a single vein about 4 feet wide. A vertical shaft at the junction has followed the vein for 30 feet, and a shaft on the western vein is 24 feet deep. Drifts, now inaccessible, follow the east vein from the bottom of the deeper shaft. In addition there has been some surface trenching along the vein to a depth of about 30 feet, and at least 3 diamond-drill holes were drilled in 1944.

Production has been intermittent. Robertson is reported to have shipped 3,000 pounds of tungsten concentrate to Germany in 1914. In 1939, while under lease to J. E. Hanway of Casper, Wyo. (Rushmore Mining Co.), 75 tons of sorted ore was shipped to the Wolfe Tongue Mill at Boulder, Colo. In 1944, T. J. Oltman of Lemmon and W. O. Fillmore of Spearfish, S. Dak., cleaned out part of the old workings and did some exploratory drilling. There is no record of any ore being shipped.

Ref: 52, pp. 62-63.

C-135, Glendale (M. S. 1111), Beryl, Feldspar, Tin, Keystone District, Pennington County

The Glendale group, consisting of 10 and a fraction lode claims, is in the SW1/4 sec. 14 and the NW1/4 sec. 23, T. 2 S., R. 6 E. on the south side of Iron Creek just below the old settlement of Glendale. The group reportedly is owned by Clyde Cessna of Rapid City, S. Dak., and is leased to E. H. Johnston.

Mining at the property has been intermittent in recent years. In 1939 Dennis Henault and a Mr. Green produced a total of 4.005 tons of beryl from the property and sold it to the Consolidated Feldspar Corp. at Keystone.

The term Glendale, as it appears in earlier literature, may refer to this group, to other claims near the settlement of Glendale, or to the Glendale Tin Co., which built a 150-ton tin mill at Glendale sometime during the tin boom years before 1892.

C-136, Old Bill (M. S. 1899) (El Dorado), Gold, Silver, Unorganized District, Custer County

The Old Bill group consists of 10 patented claims lying 5 miles northwest of Custer and about 1 mile west of Tenderfoot on the Deadwood branch of the Chicago, Burlington, & Quincy Railroad. The group is in the S1/2 sec. 33, T. 2 S., R. 4 E. and extends down into sec. 4 of the adjacent township.

Several quartz fissure veins cut obliquely across the pre-Cambrian schist and slate. The largest vein strikes N. 10° W. and dips 52° west. It ranges from 5 to 8 feet in width and has been traced down dip for an inclined distance of 140 feet. Gold occurs in the quartz, and the richest ore is reported to be near the hanging wall.

Development consists of a 6-foot by 8-foot main shaft 140 feet deep, which follows the dip of the vein. The vein system, of which only the 1 vein has been developed, has been traced by trenches and pits for 200 feet south of the shaft and for 4,000 feet north of it.

In 1937, the property, then owned by a group of Custer men and renamed the El Dorado, was being developed by a crew of six men. There has been no subsequent activity.

The only production recorded is 3.02 ounces of gold recovered from 20 tons of quartz during the 1937 operation.

A small amalgamation and table concentration mill was later dismantled.

Ref: 1, pp. 126-127; 37, pp. 76-77.

C-137, Grand Junction and Hartford Group, Gold, Silver, Unorganized District, Custer County

The Grand Junction group consists of 2 patented 10-acre claims, the Hartford (M. S. 196) and Grand Junction (M. S. 194), in the E1/2 of the W1/2 sec. 29, T. 2 S., R. 4 E. The claims were located in 1878 by C. C. Crary of Custer who built a small stamp mill about 1 mile from the mine. Subsequent owners built a 40-stamp mill on Spring Creek in 1880. This mill operated on ore from an opencut 200 feet long, 75 feet wide, and 70 feet deep, but shut down in 1881. Development in 1881-82 included several smaller cuts, two adits, and a shaft reported to have reached the 130-foot level. Other than prospecting, there has been no activity at the property since 1882.

The ore is in a brecciated zone along the hanging wall side of a large irregular quartz dike. The dike strikes N. 5° W. and dips steeply west. It has been traced as a conspicuous outcrop for about 2 miles. Mineralization extends into the schist for an average distance of 15 feet.

About 7,000 tons of ore containing $3.59 a ton in gold was milled in 1880.

Ref: 1, pp. 135-137; 2, p. 206; 61, 1891, 1899.

C-138, Saginaw (Gold Reserve), Gold, Silver, Unorganized District, Custer County

The old Saginaw property, known today as the Gold Reserve, is in sec. 34, T. 2 S., R. 3 E. about 8-1/2 miles northwest of Custer, S. Dak. In 1901 the Saginaw Gold Mining Co. held 317 acres of ground on the north fork of French Creek. Of this 57 acres were patented. At present the property consists of 1 unpatented claim and 4 patented claims and is owned by S. R. Heber of Custer.

The deposit is a series of quartz veins containing pyrite, arsenopyrite, and free gold. The main vein, which can be traced on the surface for 1,500 feet, strikes N. 50° E. and dips southeast. This vein was explored by diamond drilling in 1902.

Development includes a 384-foot shaft that cut the main vein at 270 feet, a 70-foot shaft, and a short drift.

A 10-stamp amalgamation mill was built at the property between 1904 and 1908. The only production records available indicate that about 730 tons were milled in 1908-19; this yielded 97.39 ounces of gold and 22 ounces of silver. Except for examination in 1936 by the Custer Consolidated Gold Mining & Milling Co., the property has been idle since 1909.

Ref: 1, p. 130; 2, pp. 202-203; 37, p. 72; 61, 1902.

C-139, Newark Group, Gold, Silver, Unorganized District, Custer County

The Newark group, owned by J. P. McKenna of Custer, is 5 miles west of Custer, probably in the SE1/4 sec. 24, T. 3 S., R. 3 E. It consists of 3 unpatented claims totaling approximately 60 acres.

The group lies at the north end of what old reports called the "Mineral Belt" of Custer County. On this property the deposit is a quartz vein that strikes N. 30° W. and ranges from a few inches to 5-1/2 feet in width.

This vein has been developed by a 110-foot inclined shaft, sunk before 1904, and an opencut 700 feet to the northwest. Several smaller exploration pits extend along the strike of the vein. About 80 feet of drifts are reported at the bottom of the shaft.

There is no record of early production from the Newark group. An attempt was made about 1938 to recover gold from ore on the dumps by means of a small stamp mill.

Ref: 1, p. 132; 2, pp. 200-201; 37, p. 76.

C-140, Turk Group, Gold, Silver,
Unorganized District, Custer County

The Turk group, consisting of 6 unpatented claims, lies 5 miles west of Custer, just south of the Newark group. It probably is in the NE1/4 sec. 25, T. 3 S., R. 3 E. The most recent owner is L. McKenna; the property has been in the McKenna family for at least 50 years.

The deposit is a quartz vein in sheared schist. An early report indicates that some telluride ores were encountered in the Turk workings.

Development, probably all done before 1904, consists of a 70-foot shaft and 40 to 50 feet of drift along the strike of the vein.

Apparently some high-grade ore was removed from the Turk around the turn of the century, but there is no record of the amount or the value.

Ref: 1, p. 132; 2, pp. 200-201.

C-141, Golden Crown (Leroy Mine), Gold, Silver,
Unorganized District, Custer County

The Golden Crown mine consists of 1 unpatented 20-acre lode claim, located 3-1/2 miles northwest of Custer in sec. 3, T. 3 S., R. 4 E. It was formerly part of the holdings of the Leroy Mining & Milling Co. but is now owned by Fred Brown and A. J. Muller of Custer, S. Dak.

Gold is found in a quartz vein that cuts the pre-Cambrian schist. The vein strikes N. 10° W., dips 60° W., and has an average width of 20 inches.

Development consists of an 85-foot shaft with 125 feet of drift at the bottom. The shaft was sunk and drifting began before 1904. A 10-stamp mill on the claim was operated intermittently during 1905 and 1906. The recorded production for the property, confined to those years, is 24 tons of quartz, which yielded 18.91 ounces of gold.

Lincoln reported a 5-stamp mill on the ground in 1936; at that time a small amount of examination work was being done for an RFC loan.

Ref: 1, p. 133; 2, p. 206; 37, p. 71.

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C-142, Gold Fish, Gold, Silver,
Unorganized District, Custer County

The Gold Fish group is about 3-1/2 miles northwest of Custer, probably in sec. 3, T. 3 S., R. 4 E. It consists of 4 unpatented claims totaling about 60 acres and is owned by Gladys Wells of Custer, S. Dak. In the early 1900's it was part of the holdings of the Gladiator Gold Mining Co. of Lead, S. Dak.

The deposit is a zone of quartz stringers that strikes N. 30° W. and dips 60° SW. Individual veinlets range from 1/4 inch to 12 inches in thickness. The zone has been traced for 400 feet at the surface.

Development consists of a 2-compartment, vertical shaft 68 feet deep, a 30-foot crosscut to the vein, and drifts in the vein extending 12 feet northwest and 28 feet southeast from the shaft.

No production from the property is reported. Except for some activity at the mine in the middle 1930's, the Gold Fish has been idle since about 1905.

Ref: 1, p. 133; 2, p. 190.

C-143, Ross (Highland) Mine, Feldspar, Beryl,
Custer District, Custer County

The Ross mine, known also as the Highland, is in the NE1/4 sec. 30, T. 3 S., R. 4 E. about 4 miles west of Custer. The mine was opened in 1907 by the Westinghouse Manufacturing & Electric Co. and is now owned by the New York Holding Co. of Custer.

The deposit is an elliptical mass of pegmatite that crops out as a small knoll about 220 feet long and 150 feet wide.

At least three zones are present. These include a wall zone of albite and quartz, with microcline, tourmaline, muscovite, and beryl, and two core zones of perthite, with quartz and albite. Accessory minerals in the core include garnet, tourmaline, muscovite, beryl, columbite, and lithiophilite. Feldspar is the principal economic mineral, but a little beryl and scrap mica have been shipped, together with a few hundred pounds of columbite.

Development is by a large open pit, an inclined shaft and stope, a 90-foot adit, and a small prospect pit. The opencut is 120 feet long, 100 feet wide, and 65 feet deep. The inclined shaft is 46 feet deep.

Between 1938 and 1942 the mine produced 8,300 tons of feldspar, 59 tons of beryl, and 308 tons of scrap mica.

Ref: 30, p. 60.

C-144, Bebington Group, Gold, Silver,
Unorganized District, Custer County

The Bebington group of claims lies astride U. S. Highway 16 about 2-1/2 miles west of Custer. It is in sec. 33, T. 3 S., R. 4 E. about 1-1/2 miles northeast of the Ruberta group.

The ore occurs as a series of quartz veins 2 inches to 8 feet or more in width, which cut the pre-Cambrian schist and quartzite. Individual quartz masses are short, but the zone has a general northwest strike. Samples taken by Allsman during his investigation in 1938 showed values ranging from $2.80 to $10.50 a ton, with gold at $35 an ounce.

There has been no development or production from the property.

Ref: 1, p. 138.

C-145, Wild Rose (Grant), Gold, Silver, Unorganized District, Custer County

The Wild Rose group consists of 3 unpatented lode claims totaling approximately 60 acres. It is about 2 miles northeast of Custer, probably in sec. 18, T. 3 S., R. 5 E. Jesse Harris of Custer is part owner.

The deposit is described by Allsman as an irregular quartz fissure vein associated with pegmatite dikes in schist and slate. Both the schist and the slate are intensely distorted and fractured, and the quartz veins consequently are irregular in size and distribution.

The property is developed by a 200-foot single-compartment vertical shaft, with 185 feet of drifts on the 50-foot level and 170 feet of drifts on the 100-foot level. A winze also connects the 100- and 200-foot levels. Several small narrow stopes were mined above the 2 levels. There are several small opencuts.

A small mill was operated intermittently on the property between 1934 and 1937, but only a very small amount of quartz was mined and milled. The scattered nature of the ore shoots apparently made large-scale mining impossible, and the grade of the ore would not support the small-scale selective mining that was necessary.

Ref: 1, pp. 134-135; 37, p. 83.

C-146, Oneota (Mineral Hill), Gold, Silver, Unorganized District, Custer County

The Oneota lode is about 2-1/2 miles west of Custer in sec. 21, T. 3 S., R. 4 E. It has recently been owned by W. A. Nevin and associates of Custer, S. Dak.

The ore body is a conspicuous quartz vein 3 to 4 feet wide, which cuts pre-Cambrian schist and slate. Development is reported by Allsman to consist of a 65-foot shaft, a 40-foot shaft, a 60-foot adit, and several shallow cuts and trenches along the strike of the vein.

Assays of the quartz, cited by Allsman, ranged from $1.05 to $7.00 a ton at the new price of gold; grab samples of the oxidized wall rock assayed $1.40 a ton.

No production has been reported from the property.

Ref: 1, p. 135.

C-147, North Star (Hard Scrabble), Gold, Silver, Unorganized District, Custer County

The Hard Scrabble group consists of 8 unpatented claims 7 miles northwest of Custer in sec. 2, T. 3 S., R. 3 E. It is owned by Frank A. Miller of Custer, S. Dak.

Small quartz veins crop out on all of the claims. According to Allsman the most important veins are on the Hard Scrabble, the Straussburg, the Gold Hill, the Golden Erie, the Owl, and the Opulent claims. These veins range from 18 inches to 8 or 10 feet in thickness, and strike essentially parallel to the schist.

Development work, done about 1893 by the North Star Gold Mining Co., includes a 318-foot, 2-compartment shaft, with 200 feet of drifts on the 160-foot level, and 1,300 feet of drifts on the 300-foot level, as well as several shallow shafts and exploration pits on the adjacent claims.

A 10-stamp mill was built by the North Star Gold Mining Co. in 1902. In 1902-03 some 220 tons of ore produced 34.03 ounces of gold. Other than assessment work there has been no activity since 1903.

Ref: 1, pp. 133-134; 37, pp. 72-73; 61, 1893.

C-148, Western Star, Gold, Silver,
Unorganized District, Custer County

The Western Star group, owned by M. J. Kelly of Custer, S. Dak., consists of 8 unpatented claims 8 miles west of Custer in sec. 15, T. 3 S., R. 3 E.

The ore deposit appears to be a replacement rather than a quartz vein. According to Allsman, who visited the property while it was active in 1938, the deposit was formed by replacement and filling in a folded and sheared metadiorite intrusion of considerable size. The metadiorite, conformable with the enclosing schist, strikes N. 35° to 45° W. and dips steeply to the southwest.

Shaft sinking on the property began in 1938 when the Sioux Mining Co. began an 8- by 14-foot shaft in the mineralized zone. This shaft had reached a depth of 105 feet at the time of Allsman's visit. Ore samples were being tested at the St. Elmo and Echo mills. A 500-pound sample from the 95-foot level yielded $11.20 a ton in the St. Elmo mill, and a 6-ton sample run through the Echo mill assayed $6.30 a ton.

Ref: 1, pp. 127-129.

C-149, Rough Rider (Roosevelt Group), Gold, Silver,
Unorganized District, Custer County

The old Roosevelt group is in sec. 11, T. 3 S., R. 3 E. about 11 miles by road west of Custer. It consists of 4 unpatented claims totaling approximately 60 acres. Ownership in 1937 was in the hands of M. J. Kelly and Margaret E. Williams of Custer, S. Dak.

The deposit consists of an irregular quartz vein that strikes east and dips 60° to 70° north. It ranges in width from a fraction of an inch to 6 feet. Early reports indicate fabulous values in the form of tellurides, but grab samples by Allsman assayed only $0.70 to $1.75 a ton for mine-run quartz.

Development before 1900 consisted of a 40-foot shaft and 1 small opencut. Shortly after the turn of the century, Otto T. Grantz, who discovered the Hidden Treasure mine at Lead, organized the Grantz Gold Mining Co., which acquired both the St. Elmo and the Roosevelt groups in the southern Black Hills. This company sank a new, 2-compartment shaft to a total depth of 175 feet and did extensive drifting on the 90-foot level. Two shallow shafts and an opencut 100 feet long presumably were made by the Grantz company.

There is no record of production from the Rough Rider group.

Ref: 1, p. 129; 2, p. 195; 37, pp. 78-79.

C-150, Penobscot, Gold, Silver,
Unorganized District, Custer County

The Penobscot mine is about 11 miles by road west of Custer, probably in the N1/2 sec. 11, T. 3 S., R. 3 E. It lies a short distance north of the Roosevelt (Rough Rider) group.

The ore body consists of numerous narrow stringers and irregular lenses of quartz in a highly fissured zone in schist and slate.

Development was by a single open pit 90 feet in length, 50 feet in width, and up to 75 feet in depth. Allsman estimated that between 15,000 and 25,000 tons of rock had been removed from this cut, and, as little in the way of dump remains, he concluded that the entire ore body was milled or shipped. Possibly $50,000 in gold was taken from the opencut before 1900.

The property lay idle until 1935, when sampling and mill testing was undertaken on ore from the bottom of the opencut. Only 6 ounces of gold was recovered from 100 tons of ore at that time, and the project was dropped.

Ref: 1, pp. 129-130; 37, p. 77.

C-151, Echo, Gold, Silver,
Unorganized District, Custer County

The Echo lode is in sec. 23, T. 3 S., R. 3 E. about 7 miles west of Custer. It joins the Lucky Bird property on the south. In 1938 the Echo deposit was owned by George W. Bock and H. E. Bayer of Custer, S. Dak.

The ore body is a quartz vein that averages 3 feet in width. It strikes N. 65° W. and dips steeply to the southwest conformable with the enclosing schist.

Development consists of a shaft in the vein. This shaft was sunk to a depth of 70 feet in the early days and deepened to 120 feet in 1937.

In the same year a 25-ton flotation mill was built on the property. Operation of the mill was successful, but the ore was too low grade and the operation was abandoned in 1937.

There is no record of any early production. According to Allsman, 2.54 ounces of gold was produced from 17 tons of ore in the 1937 operation.

Ref: 1, pp. 70, 131.

C-152, Lucky Bird, Gold, Silver,
Unorganized District, Custer County

The Lucky Bird lode is in sec. 23, T. 3 S., R. 3 E. and lies adjacent to the north edge of the Echo lode. It is about 7 miles west of Custer.

Allsman visited this property in 1938. At that time J. W. Lenham was installing two stamps to treat quartz ore taken from opencuts along the outcrop of a quartz vein.

This vein was about 18 inches wide. Between 200 and 300 tons of quartz had been mined and stockpiled awaiting completion of the mill. The quartz was reported to run $10 in gold.

Ref: 1, p. 131.

C-153, Minnie May Group (M. S. 1996), Gold, Silver,
Unorganized District, Custer County

The Minnie May group consists of 10 patented claims totaling 185 acres. The property is on Ruby Creek, 2-1/2 miles northwest of Custer in sec. 21, T. 3 S., R. 4 E.

According to Allsman the deposit is a quartz vein about 4 feet wide.

Development consists of a 50-foot vertical shaft, said to intersect the vein at 40 feet, and several opencuts.

History is very fragmentary. This apparently is the property assembled about 1903 by J. N. Wright and incorporated under the name of the Extreme Gold Mining & Milling Co. A 10-stamp mill was built and plans were made to add a cyanide unit. Remains of the mill were on the ground when Allsman visited the property in 1938. He reports an undated test run in which 100 tons of ore, supposedly assaying $5.00 a ton, yielded only $1.50 a ton.

Ref: 1, pp. 137-138; 2, p. 199.

C-154, Holy Terror Mine, Gold, Silver,
Keystone District, Pennington County

The Holy Terror mine, one of the most famous mines in the Black Hills, is at Keystone, S. Dak. The property consists of a group of six patented claims near the southeast corner of sec. 5, T. 2 S., R. 6 E. None of the claims is full sized, and one is only a fractional claim.

The deposit is a quartz vein in schist and slate. It strikes N. 35° W. and dips 70° to 80° NE. The vein ranges in width from a few inches to 3 feet in the upper levels and from 3 feet to 6 feet in the lower levels. Most of the vein material is massive white quartz; the ore mineral is coarse, flaky gold. Few sulfide minerals are present, even in the lower levels.

Development includes 9 levels driven from a 3-compartment shaft 1,000 feet deep, and two levels from a winze to the 1,200-foot level from near the bottom of the shaft. Two of the levels extend to the adjoining Keystone mine owned by the same company.

Total production is over 150,000 tons, from which nearly $1,300,000 in gold was recovered. All of this ore was mined between 1894 and 1902, as the mine was closed in that year and allowed to fill with water. An attempt was made in 1939-41 to unwater the mine and resume operations, but after unwatering to the 700-foot level and milling ore from the adjacent Keystone workings the mine again was allowed to fill with water.

Ref: 1, pp. 91-93; 12, pp. 114-125; 17, pp. 27-28; 61, 1894, p. 8, 1897, p. 29, 1902, p. 21; B. H. Engr. vol. 17, No. 1, pp. 12-20.

C-155, Keystone Mine, Gold, Silver,
Keystone District, Pennington County

The Keystone mine is part of the Keystone-Holy Terror group of patented claims at Keystone, S. Dak. The mine workings are about 450 feet northeast of the Holy Terror shaft.

The Keystone vein was discovered in 1892, and the mine operated as an independent company until it was consolidated with the Holy Terror in 1898. The combined operation continued until 1903, but all development after 1898 was through the Holy Terror shaft.

Little is known of the Keystone vein. It apparently is parallel to veins in the nearby Holy Terror, Bullion, and Columbia mines. At least three ore shoots have been developed along the vein. The largest was 10 to 40 feet wide and 300 feet long, was mined to the 300-foot level, and is continuous to at least the 500-foot level.

Development to the 200-foot level was through the Keystone shaft. Crosscuts from the Holy Terror mine cut the vein at the 500- , 700- , and 1,000-foot levels. As much as 980,000 tons of $10 ore may be available in the Keystone mine. Most of the ore produced came from stopes above the 300-foot level; this ore had a gross value of more than $275,000 and was mined before 1903.

Ref: 1, pp. 93-95; 12, pp. 114-124; 61, 1891, p. 47, 1894, p. 8.

C-156, Bullion Mine, Gold, Silver,
Keystone District, Pennington County

The Bullion mine is about 1/4 mile north of Keystone, S. Dak., and immediately north of the Keystone-Holy Terror group of claims. The lode was located about 1877 and relocated in 1880 or 1881.

The ore bodies are irregular lenticular veins and replacement deposits in shear zones along diorite dikes. Gangue minerals include hornblende, biotite, ankerite, quartz, chlorite, and garnet. The ore minerals are arsenopyrite, pyrrhotite, chalcopyrite, sphalerite, and gold. Three lenticular ore shoots, ranging in width from 10 to 30 feet, have been opened up for 200 feet along the vein. A smaller vein, lying east of the main vein, is 8 to 10 feet wide and has been developed through a length of 100 feet.

Development was by crosscuts from the surface and from drifts and crosscuts from a shaft at the nearby Columbia mine.

Several thousand tons of oxidized surface ore was mined and milled about 1900. Ore from the lower levels was higher grade but difficult to treat because of the sulfides. Production between 1924 and 1931 totaled 35,257 tons, from which 5,630 ounces of gold and 654 ounces of silver were recovered. In addition nearly 100,000 pounds of white arsenic was recovered from concentrates shipped to the Globe smelter. Ore remaining in the mine has been estimated at 425,000 tons containing $12.75 a ton in gold.

The mine has been idle since 1930.

Ref: 1, pp. 96-101; 12, pp. 118-128; 17, p. 28.

C-157, Columbia (Maiden) Mine, Gold, Silver,
Keystone District, Pennington County

The Columbia mine is on the northeast edge of Keystone, S. Dak., adjacent to the Bullion mine on the southeast. The deposit was discovered in 1876, but development was not promising until 1909, when an 18-inch vein was discovered. This vein was mined through 2 shafts, the first 150 feet deep, and the second 200 feet deep. Intermittent mining continued until 1917.

In 1927 the Columbia was consolidated with the Holy Terror, the Bullion, and the Keystone mines. At that time the Columbia shaft was deepened to the 300-foot level and drifts were driven both north and south on the vein. The north drift eventually reached the Bullion mine, but no ore was mined from any of these workings.

The ore body at the Columbia mine is a narrow quartz vein that contains, in places, as much as several hundred dollars a ton in gold. This vein lies in the strong shear zone that was extensively developed at the Bullion mine just north of the Columbia.

Production between 1909 and 1917 was 887 tons from which 1,574 ounces of gold and 315 ounces of silver were produced.

Ref: 1, pp. 101-102; B. H. Engr. vol. 17, No. 1, pp. 12-20.

C-158, Lucky Boy, Gold, Silver,
Keystone District, Pennington County

The Lucky Boy mine is at the east edge of Keystone just southwest of the Columbia mine. The property, a fractional claim, was patented in 1932.

Little is known about the vein, which apparently lies in an extension of the Keystone shear zone. This vein was opened by a 300-foot vertical shaft and an adit that connected to the shaft at the 100-foot level. Crosscuts from the shaft at the 100- , 200- , and 300-foot levels were driven to the vein, and short drifts driven in the ore shoot. On the 200-foot level an ore shoot 7 feet wide was opened for a length of 70 feet. On the 300-foot level an ore shoot 10 feet wide was developed through a length of 100 feet.

The only production recorded from the Lucky Boy is a carload of ore from the first and second levels. This averaged $4.80 a ton, with gold at $20.67 an ounce.

Ref: 1, p. 102; 2, p. 189.

C-159, Gold Hill Lode, Gold, Silver,
Keystone District, Pennington County

The Gold Hill lode is southwest of the Columbia and the Lucky Boy mines, adjacent to Keystone, S. Dak. The property is a fractional claim and is not patented.

Both the Keystone and the Bullion-Columbia shear zones are exposed in a crosscut adit on the Lucky Boy claim, but gold is present only in minute amounts and no ore has been developed.

Mine workings consist of a 600-foot crosscut driven eastward from a hillside. The shear zones are exposed in this crosscut.

No production is reported from the property.

Ref: 1, p. 102.

C-160, Egyptian Group, Gold, Silver, Keystone District, Pennington County

The Egyptian group of claims is about 3/4 mile northwest of Keystone, S. Dak. The claims are not patented.

The deposits are quartz stringers in shear zones in slate and schist. Little is known of the size or extent of the lode, but it probably is similar both geologically and mineralogically to the nearby Bullion lode. The ore is low grade.

Development consists of a 250-foot shaft.

The only production reported is 23 tons mined and shipped in 1934. This yielded 15.53 ounces of gold, or about $23.60 a ton with gold at $35 an ounce.

Ref: 1, pp. 103; 37, p. 135; B. H. Engr. vol. 17, No. 1, pp. 12-20.

C-161, Nathaniel Pope, Gold, Silver, Keystone District, Pennington County

The Nathaniel Pope claim lies just east of the Egyptian claims, and usually is considered as part of the Egyptian group. The claim is unpatented and is about 1/2 mile northwest of Keystone, S. Dak.

The deposit consists of quartz stringers in a shear zone in slate and schist. The size and extent of the lode is not known, but most of the ore is low grade. Mineralogically the ore is similar to that in the veins of the nearby Bullion and Columbia lodes.

Development includes a 100-foot shaft, a drift, and a 50-foot crosscut.

Production is not known but undoubtedly is small. Eleven tons of ore produced in 1911 yielded 11.17 ounces of gold.

Ref: 1, p. 103.

C-162, Bismark-Ida Florence Group, Gold, Silver, Keystone District, Pennington County

The Bismark and the Ida Florence groups are about 3/4 mile northwest of Keystone, S. Dak. The combined group consists of 8 patented claims totaling 95 acres; the claims lie between the Egyptian and the Juniper properties.

First developed about 1893, the property was only intermittently active from 1904 to 1936. In 1936 the claims were acquired by the Mines Finance & Development Shares, Inc., but that operation also was short lived.

Ore bodies of the Bismark-Ida Florence group are veins and replacements in shear zones. Vein minerals include abundant quartz and hornblende, with arsenopyrite, pyrite, and pyrrhotite. Most of the ore is associated with diorite dikes.

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The Bismark vein was developed by a 450-foot shaft and 1,500 feet of drifts and crosscuts and the 100- , 200- , 300- , and 400-foot levels. Development on the Ida Florence consists of a 300-foot shaft from which 2,000 feet of drifts were driven on the 45- , 85- , 115- , 200- , and 300-foot levels.

Recorded production totals 4,479 tons, from which 1,079 ounces of gold and 119 ounces of silver was recovered. Reports indicate that more than 125,000 tons of ore remains in the mine. Of this, 24,400 tons would average $6.05 a ton in gold, 13,000 tons would average $5.63, and 21,300 tons would average $5.50.

Ref: 1, pp. 103-107; 37, pp. 124-125; B. H. Engr. vol. 17, No. 1, pp. 12-20.

C-163, Legal Tender Group, Gold, Silver, Keystone District, Pennington County

The Legal Tender group of 5 patented lode claims and a patented placer claim is about 1 mile west of Keystone in the SE1/4 sec. 6, T. 2 S., R. 6 E. The property is owned by Mrs. M. M. Gerard.

The deposit is in a northeast-trending shear zone. Little is known of the size or character of the ore, but assays of samples taken shortly before 1938 indicate that the lode is low grade. These samples assayed from $2.80 to $3.80 a ton, with gold at $35 an ounce.

Development includes a 65-foot shaft, 2 adits 50 and 150 feet long, and several shallow shafts and test pits.

No production is reported from the property.

Ref: 1, pp. 109-110.

C-164, Beckman, General Custer, Gold Coin Groups, Gold, Silver, Keystone District, Pennington County

The Beckman, the General Custer, and the Gold Coin groups lie about 1 mile northwest of Keystone along the continuation of the Keystone "gold belt."

All of the groups have been prospected by shallow shafts, opencuts, and short adits, but none has produced ore. Most of the openings show some gold, and a few isolated stringers are reported to be high grade.

The Keystone gold belt or shear zone is not well defined on the Beckman group, and extensive cross fracturing is apparent. Northwest of this group is a large diorite intrusion, which appears to split the shear zone and which may explain the lack of definition of the zone farther south.

Ref: 1, p. 107.

C-165, Big Hit, Gold, Silver, Keystone District, Pennington County

The Big Hit group of 3 unpatented claims is about 1 mile southeast of the Keystone in the S1/2 sec. 9, T. 2 S., R. 6 E. Two of the claims extend into section 16 on the south.

The size and extent of the vein is not known, but the ore apparently is composed largely of arsenopyrite and other sulfides. A sulfide ore body on the 200-foot level is reported to contain ore ranging in value from $7 to $10 a ton, but selected samples from the dumps assayed only $3 to $4.

Development is by a 200-foot vertical shaft with two levels. The 200-foot level is 300 feet long and reportedly cut the sulfide ore described above.

No production is reported from the property.

Ref: 1, p. 102.

C-166, Eclipse Group, Gold, Silver,
Keystone District, Pennington County

The Eclipse group is about 2-1/2 miles southeast of Keystone. The group is composed of 7 and a fraction patented claims, 3 unpatented claims, and 1 patented placer claim. Most of the claims are in the NW1/4 sec. 22, T. 2 S., R. 6 E.

The deposits are replacements and fracture fillings in shear zones. At least four zones have been partly explored. Most, if not all, of the gold is associated with arsenopyrite; some of the dump material assays as high as $7 a ton with gold at $35 an ounce.

Development includes several shallow shafts and opencuts.

No production has been reported from the property.

Ref: 1, pp. 102-103.

C-167, Grand Island Group, Gold, Silver,
Keystone District, Pennington County

The Grand Island group usually is considered as part of the adjoining Egyptian and Nathaniel Pope groups. The combined groups lie northwest of the Keystone and the Bullion properties and on the same mineralized shear zone.

The deposits are similar to those at the Keystone. The ore is quartz with arsenopyrite, pyrite, pyrrhotite, and a little gold. Most of the ore is low grade.

Development is by a shaft 100 feet deep.

No production has been reported from the Grand Island group, and only a few tons has been mined at the Egyptian and the Nathaniel Pope.

Ref: 1, p. 103.

C-168, Heidepriem and Cattles Mine, Feldspar,
Custer District, Custer County

Heidepriem and Cattles pegmatite mine is near the center of sec. 35, T. 3 S., R. 4 E. about 2 miles southwest of Custer. The property, an unpatented claim, is owned by Fred Heidepriem of Custer, S. Dak.

The deposit is a vertical pegmatite about 150 feet long and 25 feet wide that strikes eastward in schist. A feldspar "dike" in the pegmatite contains good-quality potash feldspar. This lens of feldspar is surrounded by wall zones made up of quartz, mica, and tourmaline.

Development is by an opencut about 10 feet wide and 12 feet deep that followed the feldspar about 50 feet. The property was operating in 1938; two men were drilling, blasting, and sorting the broken feldspar. About two-thirds of the material broken was shipped.

Between 7 and 8 tons of feldspar was being sorted daily. The total production is not known.

Ref: 30, pp. 51-52.

C-169, Sylvanite Lode, Feldspar, Custer District, Custer County

The Sylvanite lode is about 3 miles northeast of Custer, in the NW1/4 sec. 17, T. 3 S., R. 5 E. The property is owned by Robert Davis of Custer, S. Dak.

The deposit is a dikelike pegmatite containing feldspar, quartz, tourmaline, and mica. Little is known of the size or extent of the pegmatite, which is exposed only in a small prospect opening.

Other than the prospect pit noted above, the property is undeveloped. No production has been made from the dike.

Ref: 30, p. 45.

C-170, Come Along Lode, Feldspar, Custer District, Custer County

The Come Along lode, owned by Robert Davis of Custer, S. Dak., includes the old Flora Tin prospect. The property is near the center of sec. 17, T. 3 S., R. 5 E. about 2-1/2 miles northeast of Custer and adjacent to the Maudlin Homestead. The claims are not patented.

The lode is a dikelike pegmatite containing potash feldspar, quartz, and mica. Some of the feldspar is good quality. Most of the quartz is in bunches with the mica.

Development is by an opencut about 300 feet long that follows the footwall of the dike. At the west end of the cut is the old Flora Tin prospect shaft about 40 feet deep. Some of the dump material from the cut shows a small amount of cassiterite.

Production is not known but undoubtedly is small.

Ref: 30, pp. 45-46.

C-171, New Deal Lode, Feldspar, Custer District, Custer County

The New Deal lode, owned by Carl Roseberry of Custer, S. Dak., is in the W1/2 sec. 9, T. 3 S., R. 5 E about 4 miles northeast of Custer.

The deposit is a pegmatite dike in schist. Most of the dike material is good-quality feldspar. Accessory minerals include quartz, a small amount of mica, and very little tourmaline.

Development is by an opencut 4 feet wide that was driven 10 feet then widened to 8 feet and driven 30 feet farther. The face is 15 feet high.

Production at the time of an examination in 1938 was 150 tons of sorted feldspar.

Ref: 30, pp. 61-62.

C-172, Shamrock No. 1 Lode, Feldspar, Custer District, Custer County

The Shamrock No. 1 lode is 1-1/2 miles east of Custer, in the NW1/4 sec. 29, T. 3 S., R. 5 E. The property is owned by Mr. Mortenson of Custer, S. Dak.

The deposit is a vertical pegmatite in granite. Dike minerals include feldspar, quartz, mica, tourmaline, amblygonite, and spodumene. The feldspar is the only mineral present in commercial quantities.

Development is by a small opencut at the north end of the dike. About 15 tons of feldspar had been shipped from this cut by 1938.

Ref: 30, p. 48.

C-173, Custer Mountain (Snookum) Lode, Feldspar, Mica, Beryl, Custer District, Custer County

The Custer Mountain lode, owned by the George Beach Estate, is in Heidepriem Gulch, 2-1/2 miles southeast of Custer. It lies in the SE1/4 sec. 30, T. 3 S., R. 5 E. near the south side of the section.

The deposit is an irregular pegmatite about 1,100 feet long and 275 feet wide. Most of the pegmatite is feldspar, but it contains mica, beryl, spodumene, and lepidolite in important amounts and scattered crystals of columbite-tantalite.

Development includes a large opencut and several smaller cuts and pits. The main cut is 125 feet long, about 45 feet wide, and 35 feet deep. This cut was made before 1942. In 1944 a small cut was made in the floor of the opencut at the north end. This cut, 5 feet deep, disclosed lepidolite and spodumene and may indicate a lepidolite core.

Total production is not known. In the year ending in July 1938, about 2,500 tons of feldspar was shipped, and 8 tons of scrap mica, 5 tons of beryl, and 10 tons of spodumene were stockpiled at the mine.

Ref: 30, pp. 59-60.

C-174, Rambler Lode, Feldspar, Custer District, Custer County

The Rambler lode, owned by Cleo Worman and C. E. Donnelly, is about 3 miles southeast of Custer in the E1/2 sec. 31, T. 3 S., R. 5 E.

The deposit is a pegmatite dike that strikes north in schist and quartzite. Most of the dike is potash feldspar of good quality. Accessory minerals include small amounts of quartz and mica. Little or no tourmaline is present.

Development is by a single opencut 10 feet wide, 20 feet long, and 10 feet deep at the face. Material from the cut was trammed 40 feet and lowered on a gravity plane to a storage bin.

About 100 tons of feldspar had been shipped in 1938. A small amount of mica, hand sorted from material along the walls, also was produced.

Ref: 30, pp. 55-56.

C-175, Wayside Lode (Pinecone), Feldspar, Mica,
Custer District, Custer County

The Wayside lode, owned by Cleo Worman and C. E. Donnelly, is 4 miles southeast of Custer in the SW1/4 sec. 33, T. 3 S., R. 5 E. It was located by Herman McGuire in May 1936.

Several pegmatites have been explored with small opencuts at the Wayside property. The two most northerly pits are in a pegmatite about 80 feet long and 5 to 10 feet wide. These expose a narrow mica zone along the footwall of the pegmatite. The zone is only 6 to 12 inches thick, and the mica books are small and badly air stained. The core of the dike is perthite and quartz.

The main development opening is in a feldspar dike south of the mica-bearing dike described above. The opencut is 8 feet wide, 25 feet long, and 10 feet deep at the face. A small amount of feldspar has been shipped from this pit.

Ref: 30, p. 56.

C-176, Sonny Boy Lode, Feldspar,
Custer District, Custer County

The Sonny Boy lode, owned by Henry Shindelbower and Lloyd Hampton, is 4 miles southeast of Custer, adjacent to the Wayside lode, in sec. 33, T. 3 S., R. 5 E.

The deposit is an irregular pegmatite in pre-Cambrian rock. Little is known of the size or composition of the pegmatite, but it apparently is mostly feldspar.

When Guiteras visited the property in 1938 a diamond-drilling program was underway. The results of that drilling program are not available, but production records do not indicate that the property is more than a prospect.

Ref: 30, p. 56.

C-177, Tillison's Mine, Feldspar, Mica,
Custer District, Custer County

Tillison's feldspar mine is about 4 miles east of Custer in the NE1/4 sec. 28, T. 3 S., R. 5 E. The present ownership is unknown.

The deposit is a dikelike pegmatite that strikes northeast. It contains feldspar, quartz, mica, abundant tourmaline, and considerable lithiophilite. Most of the feldspar is relatively free from tourmaline.

Both potash feldspar and mica have been produced at the property but the amounts are not known. When Guiteras visited the mine in August 1938 it was idle, although several men had been working shortly before that time.

Ref: 30, p. 48.

C-178, Lee Burrows' Dike, Feldspar, Custer District, Custer County

This dike, owned by Bud Landis of Custer, S. Dak., is about 5-1/2 miles by road southeast of Custer in the NE1/4 sec. 33, T. 3 S., R. 5 E. The property is about 2 miles south of the Annie Tallent Monument and 1/2 mile due south of the Walsh ranch house. It has been operated under lease by Lee Burrows.

The deposit is a pegmatite dike in schist and quartzite. Dike minerals include feldspar, quartz, mica, and tourmaline. Most of these are blocky, but are mixed; clean feldspar can be had only by sorting.

Development is by an opencut 10 feet wide, 50 feet long, and 20 feet deep at the face. A smaller cut has been driven about 50 feet east of the main cut.

The total production is not known, but some feldspar has been shipped from the property.

Ref: 30, p. 61.

C-179, Hot Shot Mine, Feldspar, Mica, Custer District, Custer County

The Hot Shot pegmatite is about 6 miles southeast of Custer, S. Dak., in the W1/2 of sec. 34, T. 3 S., R. 5 E. The property is owned by Thelan Staudy and E. A. Staudy of Custer.

The deposit is a steep-dipping pegmatite about 700 feet long and 50 feet wide. Most of the material in the central 30 feet of the pegmatite is good-quality feldspar. Accessory minerals include quartz, mica, and tourmaline; most of these are readily sorted from the feldspar.

Development includes an opencut and underground workings. The opencut is 50 feet long, 30 feet wide, and 30 feet deep. Underground workings consist of a 112-foot shaft with a short drift at the 60-foot level and crosscuts at the 112-foot level. In 1947 the Federal Bureau of Mines drilled three diamond-drill holes through the pegmatite. These totaled 667 feet, and this work was followed in 1948 by 44 feet of shaft sinking (to the 112-foot level) and driving the crosscuts, which totaled 104 feet.

Production figures are not complete but considerable feldspar has been shipped from the deposit, as well as about 10 tons of mica.

Ref: 30, p. 41; 40, pp. 37-49.

C-180, Beck Lode, Feldspar, Custer District, Custer County

The Beck lode, owned and operated by Kerf Beck, is in the W1/2 sec. 34, T. 3 S., R. 5 E. The property is just north of the Tinsley mine about 6 miles southeast of Custer, S. Dak.

The deposit is an irregular pegmatite in schist and quartzite. Boundaries of the pegmatite are not clear, but the central part is feldspar of good quality. Quartz and mica are found with the feldspar, together with a small amount of beryl in crystals 1 inch to 8 inches in diameter.

Development is by an elliptical pit about 75 feet long, 30 feet wide, and 20 feet deep. Material broken in the pit was about half feldspar. Production in 1938 was about 5 tons of sorted feldspar a day. During 2 months in 1942 about 200 pounds of beryl also was sorted and shipped.

Ref: 30, p. 41.

C-181, Tinsley Mine (Elkhorn), Feldspar, Mica, Beryl,
Custer District, Custer County

The Tinsley feldspar mine is near the center of the W1/2 sec. 34, T. 3 S., R. 5 E. midway between the Hot Shot and the Beck mines. The property is owned by Carl Roseberry of Custer, S. Dak.

The deposit is a pegmatite dike about 900 feet long and 3 to 25 feet wide. The dike strikes east and dips 45° to 60° north. Most of the core of the dike is good-quality feldspar. Narrow border zones in both walls contain numerous beryl crystals from 1 inch to 3 inches in diameter. Other minerals in the dike include rose quartz, cleavelandite, muscovite, and tourmaline.

Development is by two opencuts. The main pit is 100 feet long, 30 feet wide, and 30 feet deep at the face. The face was advanced in 10-foot benches. About half the material broken was shipped as feldspar.

The pegmatite was diamond drilled several years ago by the Federal Geological Survey. Six holes, totaling about 880 feet, proved the continuity of the dike, but exact figures are not available.

Production figures are not complete, but about 5,000 tons of feldspar has been shipped from the deposit, together with several tons of beryl, and a similar amount of mica.

Ref: 30, pp. 41-42.

C-182, Mica King Mine, Feldspar, Mica,
Custer District, Custer County

The Mica King mine is on French Creek 5-1/2 miles southeast of Custer in sec. 33, T. 3 S., R. 5 E. The property is owned by the Consolidated Feldspar Corp. of Trenton, N. J.

The deposit is a northwest-trending pegmatite in schist. It crops out for about 400 feet as a prominent ridge and is about 30 feet thick. Four zones are present in the pegmatite, but the intermediate zone adjacent to the core is the only one of economic importance. This zone, about 10 to 15 feet thick, is largely coarse perthite with quartz and minor amounts of beryl and mica. Most of the mica is badly stained. The core is quartz.

Development includes an opencut 145 feet long, 15 to 30 feet wide, and as deep as 80 feet in places. Other openings consist of an old shaft, a short adit, and several small opencuts.

Production is not known, but both mica and feldspar have been shipped from the deposit.

Ref: 30, p. 45.

C-184, Gira and Ainsley's Dike, Feldspar, Custer District, Custer County

This pegmatite is 1-1/2 miles southeast of Oreville in the NW1/4 sec. 23, T. 2 S., R. 4 E. It is owned by Gira and Ainsley of Custer, S. Dak.

The deposit is a dikelike pegmatite in schist. Most of the dike material is good-quality potash feldspar. Accessory minerals include quartz and mica. Neither is present in large amounts, and tourmaline is rare.

Development is by a small opencut about 10 feet wide and 15 feet long. The cut was 20 feet high at the face.

Several hundred tons of feldspar has been shipped from the deposit.

Ref: 30, p. 50.

C-185, Sunset Lode, Feldspar, Custer District, Custer County

The Sunset lode, owned by the Consolidated Feldspar Corp., is near the quarter corner between secs. 4 and 5, T. 3 S., R. 4 E. about 5-1/2 miles northwest of Custer.

The deposit is a pegmatite dike in schist. Most of the dike material is feldspar, intermixed with quartz, mica, and tourmaline.

Development consists of a small opencut about 8 feet wide, 15 feet long, and 5 feet deep at the face.

No production has been reported from the property.

Ref: 30, p. 84.

C-186, Sunrise Lode, Feldspar, Custer District, Custer County

The Sunrise lode is about 5 miles northwest of Custer near the SW corner sec. 4, T. 3 S., R. 4 E. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a dikelike pegmatite in schist. Most of the dike material is badly mixed feldspar, quartz, mica, and tourmaline. A 2-foot section along one of the walls is mostly feldspar.

Development is by a small opencut about 15 feet long, 6 feet wide, and 7 feet deep at the face. The 2-foot section mentioned above is exposed on the wall and in the bottom of this cut.

No production has been reported from the property.

Ref: 30, p. 81

C-187, Forty-Five Lode, Feldspar, Custer District, Custer County

The Forty-Five lode, owned by the Consolidated Feldspar Corp., is on the boundary line between sec. 13, T. 3 S., R. 3 E. and sec. 18, T. 3 S., R. 4 E. about 5 miles west-northwest of Custer, S. Dak.

The deposit is a pegmatite dike in schist. It contains feldspar, quartz, mica, and a little tourmaline. A few garnets are present in a seam in the pegmatite.

Development is by a single small opencut about 10 feet long, 8 feet wide, and 10 feet deep at the face.

No production has been reported from the property, which is only a prospect.

Ref: 30, p. 87.

C-188, White Spar Mine (Westinghouse No. 2), Mica, Custer District, Custer County

The White Spar mine, known also as the Westinghouse No. 2, is in the NE1/4 sec. 34, T. 3 S., R. 4 E. about 2.5 miles southwest of Custer. The property is owned at present by J. A. Knabe of Custer.

The deposit is a pear-shaped pegmatite about 150 feet long and 90 feet wide. Two zones are present. These include a wall zone of albite-quartz-muscovite pegmatite, and a core composed of quartz-perthite-albite pegmatite and quartz. All of the commercial sheet mica is found in the wall zone, which is about 6 feet thick. The mica, in books as large as 48 inches long, amounts to 10 percent of the zone. Accessory minerals include beryl, tourmaline, apatite, and perthite.

Development is by a 170-foot vertical shaft, with workings at 50, 100, 120, 130, and 160 feet. A winze extends 50 feet below the 160-foot level. Below 145 feet the dike could not be mined profitably; from 145 feet to the surface the mica-bearing zone has been stoped and backfilled.

Production in 1943-44 was 21,172 pounds of sheet mica and 9,770 pounds of untrimmed punch mica. Production data for earlier periods of operation are not available.

Ref: 12, p. 251; 37, p. 83; 62, pp. 389-391; 63.

C-189, White Dog Mica Mine, Mica, Custer District, Custer County

The White Dog mica mine is in the SE1/4 sec. 27, T. 3 S., R. 4 E., about 1 mile southeast of Custer. It is owned by Ralph D. Turner, Lawrence Neimen, and Patrick Dudley. Turner is the principal owner.

The deposit consists of two small pegmatites in echelon in schist. Both pegmatites strike N. 33° W. and dip 50° SW. They are narrow intrusions composed of quartz and albite, with scattered muscovite and perthite. The main pegmatite is 83 feet long and about 4 feet thick; the second pegmatite is 90 feet long and from 1 to 4 feet thick. Most of the mica is near the walls and is good quality white to light ruby mica.

Development includes an open pit and an inclined shaft about 80 feet deep with short drifts on both the 33-foot levels and at the bottom of the shaft. The open pit is about 77 feet long and 9 to 17 feet deep.

Production in 1943-44 was 580 pounds of large and small sheet mica. Some of the shipments contained as much as 50 percent No. 1 and No. 2 quality sheet.

C-190, Raver and Michaud Mine, Feldspar, Custer District, Custer County

The Raver and Michaud feldspar mine is 2 miles west of Custer in the SE1/4 sec. 28, T. 3 S., R. 4 E. It is owned by H. D. Raver of Custer, S. Dak.

The deposit is a narrow dikelike pegmatite in schist. It is about 200 feet long and strikes almost west. Most of the dike material is white microcline, with scattered segregations of intergrown quartz, mica, tourmaline, and beryl. Only the feldspar is commercially important.

Development is by a cut driven 25 feet on the level then sloped downward at 30° into a large pit.

The total production is not known, but considerable feldspar has been shipped from the deposit. In 1938 about 8 tons of sorted feldspar was being shipped daily.

Ref: 29, pp. 50-51.

C-191, Ridge Lode, Feldspar, Custer District, Custer County

The Ridge lode, a prospect owned by the Consolidated Feldspar Corp., is in the SE1/4 sec. 28, T. 3 S., R. 4 E. near the southeast corner of the section.

The deposit is a pegmatite dike in schist. It contains feldspar mixed with quartz and tourmaline. Little is known of the extent of the dike, which has been explored with a single small cut. This cut is 15 feet long, 8 feet wide, and 6 feet deep at the face.

No production has been reported from the prospect.

Ref: 29, p. 75.

C-192, Dorothy Lode, Feldspar, Mica, Custer District, Custer County

The Dorothy lode is about 2 miles southwest of Custer in the SW1/4 sec. 27, T. 3 S., R. 4 E. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is an elongate pegmatite about 200 feet long and 50 to 100 feet wide. It consists mainly of coarse-grained microcline and massive quartz. Other minerals present include albite and muscovite. Most of the mica is along the east wall of the pegmatite at the south end. Mica books average 3 inches by 4 inches. Part of the mica is ruby mica of good quality.

Development is by an opencut about 75 feet long, 75 feet wide, and 25 feet deep. Between 25 and 30 percent of the material broken in the cut was shipped as good-quality feldspar.

Production is not known exactly, but several hundred tons of feldspar has been shipped, as well as a small amount of sheet and scrap mica.

Ref: 30, pp. 71-72.

C-193, Dorothy No. 1 Lode, Feldspar,
Custer District, Custer County

The Dorothy No. 1 lode, owned by the Consolidated Feldspar Corp., is about 2 miles southwest of Custer, between the Dorothy lode and the Endicott Ranch in the SW1/4 sec. 27, T. 3 S., R. 4 E.

The deposit is an irregular mass of pegmatite in schist. It contains feldspar, quartz, mica, and tourmaline. Most of the feldspar is intergrown with quartz.

Development is by a single small opencut. This cut is 8 feet wide, 20 feet long, and 8 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 72.

C-194, Lucky Spar, Feldspar,
Custer District, Custer County

The Lucky Spar lode, owned by the Consolidated Feldspar Corp., is in the E1/2 sec. 35, T. 3 S., R. 4 E. about 2 miles south of Custer, S. Dak. The property consists of a single patented claim of 20 acres.

The deposit is a dikelike pegmatite in schist. It contains feldspar, stringers of quartz, mica, and tourmaline. Part of the feldspar is clean, but most of it is badly mixed with the quartz and other minerals.

Development includes a main cut and three prospect pits. The main cut is 10 feet wide, 20 feet long, and 10 feet deep at the face. No production is reported from any of these openings.

Ref: 20, pp. 73-74; 37, p. 74.

C-195, Big Horn Lode, Feldspar,
Custer District, Custer County

The Big Horn lode is about 1 mile north of Custer, in the S1/2 sec. 13, T. 3 S., R. 4 E. The property is owned by the Consolidated Feldspar Corp.,Trenton, N. J.

The deposit is a pegmatite dike in schist. Minerals present include feldspar, quartz, biotite, and a small amount of tourmaline.

With the exception of a small prospect pit, the property is undeveloped. The pit is 8 feet wide, 18 feet long, and 10 feet deep at the face. No production is reported from the deposit.

Ref: 30, p. 87.

C-196, Poppy Lode, Feldspar,
Custer District, Custer County

The Poppy lode, owned by the Consolidated Feldspar Corp., Trenton, N. J., is in the SE1/4 sec. 1, T. 3 S., R. 4 E. about 3 miles north of Custer, S. Dak.

The deposit is a dikelike pegmatite in schist. It contains feldspar intermixed with quartz, mica, and tourmaline. Some of the feldspar is of good quality.

Two cuts have been made in the pegmatite. One cut, 5 feet wide, 6 feet deep, and 10 feet long, was driven through the dike. A second cut 300 feet northeast of the first was made by breaking off a projection from the wall of the dike. The wall was 40 feet high.

A few tons of good feldspar was on the dump in 1938, but none had been shipped.

Ref: 30, p. 88.

C-197, OK No. 2 Lode, Feldspar,
Custer District, Custer County

The OK No. 2 lode, owned by the Consolidated Feldspar Corp., Trenton, N. J., is in the NW1/4 sec. 9, T. 3 S., R. 5 E. near the west side of the section.

The deposit is a pegmatite dike in schist. Most of the dike is feldspar, quartz, and mica. A little tourmaline is present, and considerable schist is mixed with the dike minerals, all of which are iron stained.

Development includes two small opencuts. One cut is 7 feet wide, 10 feet long, and 6 feet deep at the face. The second cut, 200 feet north of the first, is 6 feet wide, 8 feet long, and 6 feet deep at the face.

No production has been reported from the property, which is only a prospect.

Ref: 30, p. 89.

C-198, E. M. Lode, Feldspar,
Custer District, Custer County

The E. M. lode, owned by the Consolidated Feldspar Corp., is in the NE1/4 sec. 8, T. 3 S., R. 5 E. about 4 miles northeast of Custer, S. Dak.

The deposit is a pegmatite dike in schist. It contains feldspar, quartz, and mica. Most of the minerals are intermixed and all are iron stained.

A small opencut constitutes the only development at the property. This cut is 6 feet wide, 12 feet long, and 7 feet deep at the face.

No production has been reported from the prospect.

Ref: 30, p. 86.

C-199, A. M. Lode, Feldspar, Custer District, Custer County

The A. M. lode is in the NE1/4 sec. 8, T. 3 S., R. 5 E. about 4 miles northeast of Custer, S. Dak. The property, which is only a prospect, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It contains blocky bluish feldspar, quartz, and mica. All of the minerals are iron stained.

Development is by two small cuts. One of these is 8 feet wide, 8 feet long, and 6 feet deep at the face. The second cut, in the wall of the dike, is 2 feet deep, 10 feet wide, and 10 feet high at the face.

No production is reported from the property.

Ref: 30, p. 86.

C-200, Pick Lode, Feldspar, Custer District, Custer County

The Pick lode, owned by the Consolidated Feldspar Corp., is in the NW1/4 sec. 9, T. 3 S., R. 5 E. about 4-1/2 miles northeast of Custer, S. Dak.

The deposit is a dikelike pegmatite that contains feldspar, quartz, mica, and tourmaline. Most of the minerals are intermixed and badly iron stained.

Two cuts have been made in the deposit. One of these is 8 feet long, 10 feet wide, and 7 feet deep at the face. The second cut, 200 feet east of the first, is 12 feet long, 6 feet wide, and 6 feet deep at the face. Most of the material in this second cut is coarsely crystalline granite.

No production is reported from either cut.

Ref: 30, p. 86.

C-201, OK Lode, Feldspar, Custer District, Custer County

The OK lode is in the NW1/4 sec. 9, T. 3 S., R. 5 E. just north of the west quarter corner of the section. The property, which is owned by the Consolidated Feldspar Corp., Trenton, N. J., is about 4 miles northeast of Custer.

The deposit is a pegmatite dike in schist. Most of the dike material is a mixture of feldspar, quartz, mica, and tourmaline. Considerable schist is mixed with the other minerals.

Development is by two small opencuts. One of these cuts is 6 feet wide, 8 feet long, and 5 feet deep at the face. The second cut is 250 feet southeast of the first, and is 6 feet wide, 18 feet long, and 5 feet deep at the face.

No production is reported from the deposit.

Ref: 30, p. 89.

C-202, IXL Lode No. 3, Feldspar, Custer District, Custer County

The IXL No. 3 lode is in the SW1/4 sec. 9, T. 3 S., R. 5 E. about 4 miles northeast of Custer, S. Dak. The claim was located in 1937 by Scovel Johnson and is now owned by the Consolidated Feldspar Corp. of Trenton, N. J.

The deposit is a pegmatite dike in schist and granite. It contains feldspar mixed with quartz and mica. Most of the mica is in scattered books about 3 inches long and 2 inches thick. These are found in a 1-foot wall zone; the quartz-perthite core is barren.

Two small opencuts have been made in the deposit. One cut is 8 feet wide, 15 feet long, and 7 feet deep at the face.

No production is reported from the property, which is only a prospect.

C-203, OK No. 4 Lode, Feldspar, Custer District, Custer County

The OK No. 4 lode is in the SW1/4 sec. 9, T. 3 S., R. 5 E. The property is owned by the Consolidated Feldspar Corp. of Trenton, N. J.

The deposit is a large outcrop of pegmatite granite. A vertical pegmatite from 3 to 6 feet wide strikes N. 60° W. across the deposit. This pegmatite contains bluish feldspar, quartz, and mica. Most of the mica is in small books, and all of the minerals are iron stained and badly mixed.

Development is by a small opencut about 6 feet wide, 20 feet long, and 5 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 90.

C-204, Mitchell No. 2 Lode, Feldspar, Custer District, Custer County

The Mitchell No. 2 lode is in the NW1/4 sec. 9, T. 3 S., R. 5 E. adjacent to the OK and the New Deal lodes. The property, owned by the Consolidated Feldspar Corp., Trenton, N. J., lies about 4 miles northeast of Custer.

The deposit is a dikelike pegmatite in granite. It contains iron stained feldspar mixed with quartz, mica, and tourmaline.

Development is by a single small prospect pit, about 12 feet long, 5 feet wide, and 4 feet high at the face.

No production is reported from the property.

Ref: 30, p. 81.

C-205, Bet Lode, Feldspar,
Custer District, Custer County

The Bet pegmatite probably is in the NE1/4 sec. 9, T. 3 S., R. 5 E. The property, about 4-1/2 miles northeast of Custer, is owned by the Consolidated Feldspar Corp., Trenton, N. J. This property should not be confused with the Bet lode 10 miles southeast of Custer.

The deposit is a pegmatite dike in schist and granite. Dike minerals include feldspar, quartz, mica, and tourmaline. Most of the material is badly mixed and iron stained.

Development is by a single small opencut. This cut is 8 feet wide, 15 feet long, and 8 feet deep at the face.

No production has been reported from the property.

Ref: 30, p. 90.

C-206, Ottershagen Prospect, Beryl,
Keystone District, Pennington County

The Ottershagen beryl prospect is in the SW1/4 sec. 14, T. 2 S., R. 6 E. about 1 mile south of Glendale on the Bob Ottershagen ranch. Ottershagen owns the property.

The deposit is a pegmatite dike in Algonkian schist. Little is known of its size, shape, or mineral composition. A small amount of beryl is present; about 1,200 pounds was taken from a 10-foot hole.

Several small cuts have been driven to explore the deposit. In only one of these is beryl present.

Other than for the 1,200 pounds of beryl noted above, the production is not known.

C-207, Bare Top No. 2 Lode, Feldspar,
Custer District, Custer County

The Bare Top No. 2 lode is in the SW1/4 sec. 32, T. 3 S., R. 5 E. about 2-1/2 miles southeast of Custer, S. Dak. The property, an unpatented lode claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a dikelike pegmatite in quartzite. Dike minerals include feldspar, quartz, mica, and tourmaline. Most of the minerals are badly mixed.

Development is by a prospect cut 10 feet wide, 15 feet long, and 10 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 79.

C-208, Bull Moose Lode, Feldspar,
Custer District, Custer County

The Bull Moose lode, owned by the Consolidated Feldspar Corp., Trenton, N. J., is in the SE1/4 sec. 32, T. 3 S., R. 5 E. about 3 miles southeast of Custer, S. Dak.

The deposit is a pegmatite dike in granite and quartzite. Minerals present include feldspar, quartz, mica, and tourmaline. Most of the minerals are mixed but are blocky and can be sorted.

Development is by an opencut 10 feet wide, 25 feet long, and 10 feet deep at the face. No production is reported from this opening.

Ref: 30, p. 80.

C-209, Mitchell No. 1 Lode, Feldspar, Custer District, Custer County

The Mitchell No. 1 lode is in the SW1/4 sec. 33, T. 3 S., R. 5 E. near the southeast corner of the section. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a dikelike pegmatite in schist. It contains feldspar intermixed with quartz, mica, and tourmaline.

No production is reported from this prospect, which has been developed by a small opencut 6 feet wide, 6 feet long, and 10 feet deep at the face.

Ref: 30, p. 81.

C-210, IXL Lode, Feldspar, Custer District, Custer County

The IXL lode is in the NW1/4 sec. 21, T. 3 S., R. 5 E. about 3 miles east-northeast of Custer, S. Dak. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. Most of the dike material is a mixture of feldspar, quartz, mica, and tourmaline. Some of the mica is in books large enough to sort.

Development includes two shallow shafts and two small opencuts. One of the cuts is 6 feet wide, 40 feet long, and 6 feet deep. The second cut is 6 feet wide, 10 feet long, and 8 feet deep at the face. Both shafts are about 6 feet deep.

A small amount of mica was shipped from the property about 20 years ago, but no production is reported in recent years.

Ref: 30, p. 82.

C-211, IXL No. 4 Lode, Feldspar, Custer District, Custer County

The IXL No. 4 lode is near the center of sec. 21, T. 3 S., R. 5 E., about 3 miles east-northeast of Custer. The claim is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It contains a mixture of feldspar, quartz, and mica. Accessory minerals include tourmaline and garnet.

Two cuts 150 feet apart have been driven to explore the dike. One cut is 6 feet wide, 15 feet long, and 5 feet deep at the face. The second cut is 8 feet wide, 5 feet long, and 10 feet deep at the face. No production is reported from either cut.

Ref: 30, pp. 82-83.

C-212, IXL Fraction, Feldspar,
Custer District, Custer County

The IXL fraction lode is in the NW1/4 sec. 21, T. 3 S., R. 5 E. about 3 miles east-northeast of Custer, S. Dak. The property, a fractional lode claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite in schist. It contains feldspar mixed with quartz, mica, and tourmaline.

Development is by a small opencut about 10 feet wide, 12 feet long, and 6 feet deep at the face. No production is reported from the property, which is only a prospect.

Ref: 30, p. 83.

C-213, Saw Lode, Feldspar,
Custer District, Custer County

The Saw lode, owned by the Consolidated Feldspar Corp., is near the center of sec. 34, T. 2 S., R. 4 E. about 5 miles northwest of Custer.

The deposit is a dikelike pegmatite in schist. Most of the dike material is feldspar, mixed with quartz, mica, and a small amount of tourmaline.

A single small cut has been driven to explore the deposit. The cut is 10 feet long, 5 feet wide, and 8 feet deep at the face.

No production has been reported from the property.

Ref: 30, p. 87.

C-214, Arcade Nos. 1 and 2 Lodes, Mica,
Custer District, Custer County

The Arcade lodes, owned by H. L. Hofert of Custer, S. Dak., are in the NW1/4 sec. 22, T. 3 S., R. 5 E. about 4 miles east of Custer.

The claims cover a large granitic pegmatite, which forms a ridge on the west side of Bismarck Lake. Most of the mass is finegrained granitic pegmatite, but some is a coarser segregation of graphic granite, rose quartz with interstitial plagioclase, quartz, muscovite, and tourmaline.

The property has been prospected by an opencut and several small pits. The opencut, which trends N. 70° W., is 50 feet long, 20 feet wide, and 10 feet deep.

Production, as given by Mr. Hofert in 1942, amounted to about 100 tons of feldspar and 10 pounds of sheet and punch mica.

C-215, Aladdin Mine, Mica, Feldspar,
Custer District, Custer County

The Aladdin mica mine, owned by the G. W. Beach estate, is in the SE1/4 sec. 26, T. 3 S., R. 4 E. about 3/4 mile south of Custer.

Several large pegmatite masses are exposed on the claim. The Aladdin mine is developed in a pegmatite that strikes northwest, and seems to dip steeply to the southwest. The dike shows a thin border zone, a wall zone of perthite-quartz-muscovite pegmatite, and a central core of perthite-quartz pegmatite.

Development consists of an open pit, a shaft in the west end of the pit, an adit 22 feet long, and 1 small cut. The open pit is 50 feet long, 25 feet wide, and up to 30 feet deep. Most of the mining has been in the wall zone on the hanging wall side of the dike. This perthite-quartz-muscovite wall zone has been the source of the mica produced, but the feldspar has come from the perthite-quartz core.

Early history of the deposit is not known. The property was operated in 1943-44 by G. W. Beach, who produced over 300 pounds of trimmed sheet and punch mica during that interval. Most of it was classified as No. 2 inferior quality, although some was of No. 1 and No. 2 qualities. No record is available of the feldspar produced.

C-216, Ballard Mine, Mica, Beryl, Feldspar,
Custer District, Custer County

The Ballard mica mine is in the NE1/4 sec. 16, T. 5 S., R. 4 E. 2-1/2 miles northwest of Custer. The property is owned by F. Ballard of Custer, S. Dak., and is located on the northern end of the same dike as the Crown mica mine.

The deposit is a dike in an anticlinal fold. The fold strikes N. 20° N., and plunges gently to the south; the dike is about 10 feet thick. Minerals present include quartz, feldspar, muscovite, beryl, and a small amount of columbite-tantalite. Both mica and feldspar have been produced. Most of the mica is plate, punch, or scrap mica, but a small amount of sheet also has been shipped.

Mine workings include 2 open pits, a 60-foot shaft, and a short drift from the bottom of the shaft. The north pit is 90 feet long, 25 feet wide, and 30 feet deep at the face. The south pit is 60 feet long, 25 feet wide, and 15 feet deep at the face.

Mica production through 1944 was about 1,500 pounds of large and small sheet, 26,000 pounds of punch, and 96,000 pounds of scrap. Nearly 7,000 pounds of beryl also was sold during 1943.

Ref: 62, pp. 391-393.

C-217, Big Spar No. 1 Mine, Feldspar, Mica,
Custer District, Custer County

The Big Spar mine, owned by Consolidated Feldspar Corp., Trenton, N. J., is 2-1/4 miles west of Custer, in the SW1/4 sec. 21, T. 3 S., R. 4 E.

The deposit is a large mass of pegmatite several hundred feet long. It strikes northeast and dips steeply northwest.

Economic minerals in the deposit are feldspar, mica, and beryl. Two zones can be differentiated in the deposit. Both are similar in composition and are poorly defined. The wall zone is composed of perthite-quartz-muscovite pegmatite; the core is perthite-quartz pegmatite. Accessory minerals include tourmaline, garnet, and beryl.

Development is by an opencut about 75 feet long, 30 feet wide, and up to 50 feet deep. Production from this pit includes a few tons of beryl and several hundred pounds of trimmed sheet and punch mica.

C-218, Star and Blue Bonnet Claims, Mica, Beryl, Custer District, Custer County

The Star and Blue Bonnet claims are in sec. 33, T. 3 S., R. 5 E. about 4 miles southeast of Custer. The Star is owned by N. C. Spilde and William Quinn of Custer, the Blue Bonnet by Spilde, Quinn, and P. J. O'Connell.

The deposit is a gently dipping zone pegmatite 6 to 10 feet wide and 1,500 feet long. It strikes N. 65° W. and dips northeast. The hanging wall is quartzite, the footwall is schist. A wall zone of quartz, albite, and muscovite is well defined along the footwall of the pegmatite. This zone ranges from 2 to 4 feet in thickness. The core of the pegmatite is perthite and quartz. Accessory minerals include garnet, biotite, apatite, and beryl.

Most of the development has been done on the Blue Bonnet claim. This work consists of a large open pit and several small cuts.

More than 2,000 pounds of sheet mica was produced in 1943. Most of this, which was moderately stained pale to ruby mica, was No. 2 inferior quality. A small amount of punch and scrap mica, as well as a little beryl, also was shipped in 1943.

C-219, Mica King No. 3 Claim, Mica, Feldspar, Custer District, Custer County

The Mica King No. 3 lode, owned by the Consolidated Feldspar Corp., Trenton, N. J., is in sec. 33, T. 3 S., R. 5 E. about 4 miles southeast of Custer, S. Dak. The property adjoins the Star and the Blue Bonnet claims on the northeast.

The deposit is a gently dipping zoned pegmatite about 1,500 feet long and 6 to 10 feet wide. On the Mica King No. 3 claim most of the pegmatite is perthite microcline and quartz. A few patches of scrap mica also are present.

Development includes 2 small opencuts near the west end of the claim and a small pit about 300 feet east of the 2 cuts. Some feldspar has been shipped from the pit, but records are not available.

C-220, Burgess Mica Prospect, Mica, Custer District, Custer County

The Burgess mica prospect, relocated by J. C. Koch of Custer in 1943, is about 4.3 miles by road south of Custer in the SE1/4 sec. 35, T. 3 S., R. 4 E. Most of the work at the property was done by Minndak Mines, Inc., between September 1943 and January 1944.

The deposit is a small pegmatite about 80 feet long and 2 feet thick that strikes north and dips 52° W. It consists chiefly of quartz and albite, with subordinate amounts of perthite, muscovite, biotite, and tourmaline.

Development is by a 40-foot inclined shaft. Short drifts have been driven from the bottom of the shaft, which is 20 feet from the south end of the pegmatite.

Nearly 100 pounds of trimmed sheet and punch mica was produced in 1943 from 100 tons of pegmatite. Most of the mica is slightly air stained ruby mica of good quality.

C-221, Burt Mica Mine, Mica,
Custer District, Custer County

The Burt mica mine, owned most recently by Ken Koch and Edward Gray of Custer, is about 4 miles southeast of that town in the NW1/4 sec. 33, T. 3 S., R. 5 E.

The deposit is an irregularly zoned pegmatite about 600 feet long and 20 to 30 feet thick. It forms an eastward trending ridge, the north slope of which follows the hanging wall surface of the pegmatite. Where present the zones are as follows: A wall zone of perthite and albite; an intermediate zone of perthite, quartz, and muscovite; and a core of perthite and quartz. The commercial mica is in the intermediate zone. Most of this mica is pale ruby, and some of it is air stained. Locally in the zone the mica is "tied" and suitable only for scrap.

Development is by an open pit and several small prospect cuts. The main pit is 150 feet long, 50 feet wide, and about 15 feet deep.

Between June 1943 and July 1944, about 1,550 pounds of sheet mica was produced from 2,500 to 3,000 tons of rock.

C-222, Climax Mica Mine, Mica,
Custer District, Custer County

The Climax mica mine, one of the oldest mica mines in South Dakota, is about 2-1/2 miles southeast of Custer in the NW1/4 sec. 29, T. 3 S., R. 5 E. The most recent owner is the J. K. Mining Co. of Custer.

The deposit is an irregular, zoned pegmatite in schist. It strikes N. 55° E. and is vertical. Two zones have been recognized. An albite-quartz-muscovite wall zone, and a quartz-perthite-albite core. Commercial mica is found in the wall zone, which is from 1 to 4 feet thick. Most of the mica is pale ruby mica in books as large as 2 feet across. Some of the mica is ruled and in part badly air stained. In 1943-44 about 5 percent of the sheet mica sold was No. 1 quality; 20 percent was No. 2 quality.

Development is by a 178-foot shaft with levels at 80, 110, and 160 feet. The mica-bearing zone is completely mined above the 160-foot level; below that level the pegmatite is too narrow to be mined.

Recorded production since 1880 is 18,900 pounds of sheet mica, 42,400 pounds of punch and washer mica, and 277,000 pounds of scrap. The total value of this mica was about $114,000.

Ref: 12, p. 251; 36, pp. 202-203; 37, p. 69; 62, p. 395.

C-223, Custer Mica Lodes Nos. 1 and 2, Mica,
Custer District, Custer County

The Custer mica lodes, located by G. W. Siewert in 1943, are in the SW1/4 sec. 18, T. 3 S., R. 5 E. Both properties consist of single unpatented claims.

On the No. 1 claim the deposit is a narrow, zoned pegmatite about 80 feet long and only 1 to 2 feet thick. Most of the mica is in an albite-muscovite core, outside of which is a 4 to 6 inch wall zone of albite and quartz, and a border zone of muscovite-albite-quartz pegmatite about 1 inch thick.

The pegmatite on the No. 2 lode is about 100 feet long and 3 feet thick. Muscovite, in books as large as 6 inches, is distributed sparsely throughout the dike. Most of the mica is hard, dark ruby mica lightly air stained.

Development at the No. 1 lode is by two small open pits. One is 15 feet long, 12 feet wide, and 6 feet deep. The second is 10 feet long and 8 feet deep. The only work on the No. 2 lode is a small shaft about 10 feet deep.

No production has been reported from either claim.

C-224, Phelps (Roosevelt) Lode, Feldspar,
Custer District, Custer County

The Phelps lode, owned by J. D. Long and J. C. Phelps, is in the NW1/4 sec. 11, T. 3 S., R. 4 E. about 3 miles north of Custer.

The deposit is a dikelike pegmatite in granite, schist, and quartzite. It contains feldspar, quartz, tourmaline, lithiophilite, and a little mica. None of the minerals except feldspar is commercially important.

Development is by a small opencut about 35 feet long, 6 to 10 feet wide, and 20 feet deep at the face. Material broken in the cut was sorted and wheeled to a 10-ton bin.

No record of the production is available.

Ref: 30, p. 61.

C-225, Dalmon Mica Mine, Mica,
Custer District, Custer County

The Dalmon mica mine is in the NW1/4 sec. 24, T. 3 S., R. 4 E. just north of Custer, S. Dak. It was operated in 1943 by Beatty Mac Robbie of Custer.

The deposit is an elliptical pegmatite about 100 feet long and 75 feet wide. It crops out as a low knoll that trends northwest and appears to dip outward on all sides.

Most of the mica is found at the contact between the topmost unit of the pegmatite and an underlying plagioclase-quartz-muscovite unit, although some mica is found in the underlying unit. The mica is pale to deep ruby, and most of it is air stained.

Development includes several small opencuts and an adit and glory hole to the surface. Most of the cuts are 25 to 35 feet long and 10 to 20 feet wide.

Production in 1943 was 600 pounds of large and small sheet mica. Less than 15 percent of this was No. 1 and No. 2 quality; the rest was No. 2 inferior quality mica.

C-226, Dorothy V Prospect, Mica, Custer District, Custer County

The Dorothy V prospect is 1.7 miles west of Custer in the E1/2 sec. 28, T. 3 S., R. 4 E. Max Husabee of Provo, S. Dak., purchased the property from Dorothy Van Osdel in 1933. The claim contains 16 acres and is not patented.

The deposit is an elongate pegmatite about 600 feet long and 75 to 100 feet wide. Most of the pegmatite is perthite, with plagioclase, quartz, tourmaline, and intergrown muscovite and biotite. Inclusions of schist, associated with masses of quartz, cut diagonally across the pegmatite. Coarse-grained microcline-perthite, muscovite, and beryl are found in these quartz shoots. The largest mass is 40 feet long and 3 to 6 feet wide. It contains about 6 percent muscovite and 0.5 percent beryl. Other mica-rich zones can be seen in the outcrop next to the schist inclusions. Most of the mica is air stained, and the books are so small that only punch mica can be recovered.

Development is by a small cut along one of the schist-quartz bodies. This cut, 18 feet long, 6 feet wide, and 6 to 10 feet deep, produced 500 pounds of beryl and 3 tons of mica.

C-227, Dubuque and Royal Flush Claims, Mica, Beryl, Custer District, Custer County

The Dubuque and Royal Flush claims are 6 miles southwest of Custer in the SW1/4 sec. 31, T. 3 S., R. 4 E. The Dubuque claim, which is unpatented, is owned by G. Behren of Custer. The Royal Flush claim is patented and is owned by William Nevin and Mrs. Otto Newberry of Custer.

The deposit is a dikelike pegmatite about 8 feet thick and 1,000 feet long. Both claims are on this same pegmatite; the Dubuque claim is north of the Royal Flush.

Two zones make up the pegmatite. The wall zone, which contains most of the mica and beryl, is from 1 foot to 6 feet thick. Accessory minerals include albite, quartz, and tourmaline. Most of the mica is suitable only for scrap.

The core is coarse-grained microcline-perthite and massive quartz. Development consists of 5 shallow cuts on the Dubuque claim and 2 pits on the Royal Flush claim. Most of the production has come from a pit 50 feet long, 25 feet wide, and 8 feet deep near the southeast end of the pegmatite on the Royal Flush claim.

Production recorded between 1938 and 1940 includes 150 tons of feldspar, 10.6 tons of scrap mica, and 0.5 tons of beryl.

C-228, Earl Lode, Feldspar, Mica, Beryl, Custer District, Custer County

The Earl lode, owned by Langford Landis and Delbert McKenna of Custer, is in the NE1/4 sec. 33, T. 3 S., R. 5 E. The property is about 1-1/4 miles south of Stockade Lake and about 4 miles east-southeast of Custer.

The deposit is a zoned pegmatite about 200 feet long and 25 feet wide. It strikes N. 75° E. and dips about 55° NW. At least three zones are present. These include a wall zone of quartz, albite, and muscovite; an intermediate zone of albite, perthite, and quartz; and a core of quartz and perthite. Beryl is found in the wall zone and the intermediate zone, but most of the mica is in the wall zone. Muscovite books as large as 30 inches have been mined, but the average book is 10 to 12 inches in diameter. Most of the mica is ruled, air stained, and rather soft.

Development includes both surface and underground openings. The main opening is a pit 170 feet long, 50 feet wide, and 50 feet deep. An adit 44 feet below the pit floor has been driven through the dike. Short drifts have been driven along the pegmatite from the adit, and a raise connects to the open pit.

Production through 1944 included 2,400 tons of feldspar, 11.2 tons of mica, and 15 tons of beryl.

C-229, Highview Prospect, Beryl, Lithium, Custer District, Custer County

The Highview claim is in the NW1/4 sec. 36, T. 3 S., R. 3 E. about 6 miles west of Custer. It is owned by the Maywood Chemical Co. of Maywood, N. J.

The deposit is a dikelike pegmatite about 200 feet long and 3 to 15 feet thick. It strikes northwest and dips steeply westward. Two smaller parallel pegmatites are found in each side of the main dike.

Most of the core of the pegmatite is medium-grained microcline and perthite, with albite, quartz, muscovite, and lithiophilite. This core is surrounded by graphic granite where the deposit is wider than 8 feet. Accessory minerals in the core include beryl, amblygonite, and spodumene. Most of the mica, which is suitable only for scrap, is in pockets associated with quartz and albite. The mica is ruled and shows "A" structure.

Development is by two cuts in the main pegmatite and a small cut in one of the parallel pegmatites. The largest cut is 20 feet long, 15 feet wide, and 10 to 18 feet deep.

Production is not known but undoubtedly is small.

C-230, Homestead No. 2 Prospect, Mica, Custer District, Custer County

The Homestead No. 2 claim is about 1/2 mile north of Custer, in the NE1/4 sec. 23, T. 3 S., R. 4 E. It was operated by Ira Willey in 1943 under lease from William Sager and Phil Randall of Custer.

The deposit consists of 3 parallel pegmatites separated by schist partings 6 inches to 18 inches thick. The pegmatites strike northwest and dip about 40° southwest. They range from 2 feet to 10 feet in thickness and are about 100 feet long. Most of the dike material is quartz and albite, with microcline and perthite and minor amounts of muscovite and beryl.

Development is by a 35-foot inclined shaft in the westernmost dike. Other workings include two old prospect pits, one just north of the shaft and the other in the east pegmatite.

Recorded production is 40 pounds of sheet mica. This mica, which is air-stained light ruby mica, was recovered from 300 pounds of crude mica sorted from 50 tons of pegmatite. Most of the sheet is No. 2 inferior-grade mica.

C-231, Homestead No. 3 Prospect, Mica, Custer District, Custer County

The Homestead No. 3 claim is about 1 mile northwest of Custer in the NW1/4 sec. 23, T. 3 S., R. 4 E. The claim, which was located in 1943 by William Sager and Phillip Randall of Custer, lies just east of the Custer cemetery on the Custer-Oreville road.

The deposit is one of a number of parallel pegmatites that crop out in the area. It strikes northwest and dips steeply southwest. The pegmatite is about 450 feet long and 8 feet thick. Most of the dike material is quartz and albite, with scattered crystals of microcline-perthite. Moderately air stained ruby mica is abundant near the footwall.

Development consists of a small prospect shaft about 300 feet from the south end of the pegmatite.

Production is not recorded but undoubtedly is small.

C-233, Keystone Lode, Mica, Custer District, Custer County

The Keystone lode is about 5-1/2 miles southwest of Custer in the SE1/4 sec. 36, T. 3 S., R. 3 E. The property is owned by the Maywood Chemical Co., Maywood, N. J.

The deposit is exposed as the crest of a prominent ridge. Its outcrop is about 200 feet long and 40 to 60 feet wide, but the exact shape and dip of the pegmatite have not been determined.

Most of the dike material is microcline-perthite, albite, quartz, and muscovite. Accessory minerals include beryl and amblygonite. Both the mica and the beryl are associated with the quartz. About 5 percent of the pegmatite is mica, which is suitable only for scrap. The beryl is in pale-yellow crystals about 4 inches in diameter.

Development consists of several small shallow cuts across the pegmatite. No production is reported from any of the cuts.

C-234, Knowles Lode Claim, Quartz Crystals, Custer District, Custer County

The Knowles lode claim, owned by Frank Beck of Hill City, is in the SW1/4 sec. 13, T. 3 S., R. 4 E. about 1/2 mile north of Custer, S. Dak.

The deposit is a lenticular pegmatite about 230 feet long and 20 feet wide. It strikes northeast and dips about 30° SE. Most of the deposit is a medium-grained pegmatite composed of perthite, quartz, and plagioclase. Accessory minerals include biotite, muscovite, tourmaline, garnet, and beryl. Quartz crystals are found in pockets erratically scattered throughout the pegmatite.

Development is by 7 small pits and cuts, the largest of which is 30 feet long, 10 feet wide, and several feet deep.

Quartz crystals are reported to have been found in all seven of the development cuts, but no record of the production is available.

C-235, Lost Bonanza Mine (M. S. 1070), Mica, Custer District, Custer County

The Lost Bonanza mine, currently owned by A. M. Schultz and Monte Humphreus of Custer, is in the NE1/4 sec. 14, T. 3 S., R. 4 E. Between 1880 and 1884 the mine was one of the largest mica mines in the United States.

The deposit is a fine- to medium-grained plagioclase-quartz-muscovite pegmatite. It strikes northwest and dips about 45° SW. Most of the core of the pegmatite has been mined; only the wall and border zones remain in the surface openings. In the underground workings the mica is in books about 6 inches in diameter. This mica is hard, flat, deep ruby mica with moderate air staining. Most of it is No. 1 or No. 2 quality mica.

Development includes an opencut 120 feet long, an 85-foot adit that connects to the opencut by a raise, a 50-foot shaft, and a trench about 30 feet long.

Total production is listed at 26,000 pounds of sheet mica in 1880-84, and 1,000 pounds of 3/4-trim sheet sorted from the dumps in 1943.

Ref: 46, pp. 75-76; 62, pp. 394-395.

C-236, Lucky Star Prospect, Mica, Custer District, Custer County

The Lucky Star mica prospect, located in October 1943 by E. B. Adams of Fall River County, is in sec. 35, T. 3 S., R. 4 E. about 2 miles south of Custer.

The deposit is a branching pegmatite about 150 feet long and 40 to 50 feet wide. It strikes north and near the north end joins a second dike that strikes northeast.

At least two zones have been recognized in the pegmatite. A wall zone, about 4 feet thick, consists of fine-grained quartz and albite, with subordinate amounts of muscovite and biotite. Accessory minerals include tourmaline and beryl. The core of the pegmatite is massive quartz and microcline-perthite with graphic granite. Most of the mica is in the wall zone adjacent to the footwall of the dike. About 2 percent of the pegmatite is crude mica, which contains about 4 percent of sheet mica per ton.

Production in 1943-44 was 300 pounds of small and large sheet mica. From 30 to 40 percent was No. 1 or No. 2 quality; the remainder was No. 2 inferior quality.

C-237, Wilhelm Mine, Feldspar, Custer District, Custer County

The Wilhelm feldspar mine, owned by John Wilhelm, is near the northwest corner of sec. 4, T. 3 S., R. 4 E. The property is a 5-acre fraction of a patented claim.

The deposit is a knob of pegmatite about 300 feet long and 200 feet wide. About 60 percent of the mass is feldspar, part of which is mixed with quartz. Accessory minerals include beryl, columbite-tantalite, amblygonite, and muscovite.

Development is by a large opencut about 50 feet wide and 75 feet deep.

Production figures are not complete. At least 5,000 tons of feldspar have been shipped from the property, together with small amounts of beryl, columbite, amblygonite, and mica.

Ref: 30, p. 50.

C-238, Mica Queen No. 1 Prospect, Mica, Custer District, Custer County

The Mica Queen No. 1 mica prospect, held by W. J. Christie, Kenneth Springs, and Godfried Springs of Custer, S. Dak., is in the NE1/4 sec. 19, T. 3 S., R. 5 E. about 2 miles east-northeast of Custer.

Several pegmatites have been prospected at the property. These dikes range from 2 or 3 feet to as much as 12 feet in thickness and in general strike northwest. Most of the work has been done on a dike 3 to 5 feet thick composed of quartz, albite, and muscovite.

Development includes several small prospect pits and a short crosscut.

About 250 pounds of small sheet mica, 1 inch by 1 inch and 1-1/4 inches by 1-1/4 inches, was produced in 1943. No other production is reported from the property.

C-239, Mohawk Mica (Langford) Mica, Custer District, Custer County

The Mohawk mica prospect, owned by L. L. Landis and Delbert McKenna, is on the top of a ridge in the SW1/4 sec. 27, T. 3 S., R. 5 E.

Two pegmatites have been prospected at the property. One pegmatite, containing ruby mica, is 270 feet long and 10 feet wide. The second pegmatite is 60 feet from the first and contains feldspar and green mica.

The ruby-mica dike has a core of plagioclase, microcline, and quartz in crystals and mass as large as 8 feet in diameter. The mica is in this core in books 6 or 8 inches across. Most of the mica is heavily air stained.

The feldspar-green mica pegmatite is oval in plan and is 100 feet long by 50 feet wide. In this pegmatite also the mica is in a coarse-grained core of feldspar and quartz. Some of the mica is in books as long as 12 inches, but most of it is air stained and shows "A" structure.

Development includes an open pit 50 feet long, 15 feet wide, and 10 feet deep in the dikelike pegmatite.

Production in 1944 was 767 pounds of crude mica that yielded 36.6 pounds of small and large sheet. No other production is reported.

C-240, Surprise Mica Mine, Mica, Custer District, Custer County

The Surprise mine is in the NW1/4 sec. 24, T. 3 S., R. 4 E. The claim, located in 1941 by J. T. Morine and F. D. Peterson of Custer, S. Dak., is 1/2 mile north of that town.

The Surprise mine is on one of several pegmatites on the claim. The Surprise dike strikes essentially east and dips 35° to 40° south. It has a maximum observed width of 8 feet and has been traced for 220 feet. Books of muscovite as large as 8 inches in diameter are scattered irregularly through a matrix of perthite, albite, and quartz. Accessory minerals include tourmaline, garnet, biotite, apatite, and beryl. Most of the mica is heavily stained.

Development consists of three small open pits and a shaft sunk to a depth of 52 feet along the hanging wall. Short drifts were driven from the foot of the shaft.

Production of mica began in 1943. All sheet has been 1-1/2 by 2 inches or smaller in size. Total production is 484 pounds of sheet mica in 1943 and 47 pounds in 1944.

C-241, Sunshine Mica Prospect, Mica, Custer District, Custer County

The Sunshine mica prospect is 1-1/2 miles north of Custer, S. Dak. in the SE1/4 sec. 14, T. 3 S., R. 4 E. The property is held by Howard Townsend and Gus Hendrickson of Custer.

Two pegmatites 6 to 15 feet wide have been prospected on the Sunshine claim. One of the pegmatites is an unzoned mass of microcline, quartz, and biotite containing a small amount of reeved, air-stained mica. The second dike is zoned and consists of a wall zone of quartz-albite-muscovite pegmatite and a core of quartz and perthite. Mica, in books up to 6 inches in diameter, is found in the wall zone. Most of the mica is air and mineral stained and badly reeved. A few beryl crystals occur in the core.

Development is by two open pits, one in each dike.

Production includes about 250 tons of feldspar and 60 pounds of sheet mica. About 25 pounds of this sheet mica was cut from 600 pounds of crude mica, indicating a recovery of 4.2 percent.

C-242, Terry and Terry No. 1 Claims, (M. S. 2039), Mica, Custer District, Custer County

The Terry and Terry No. 1 lode claims, formerly known as the Thom Carroll property, are in the SE1/4 sec. 19, T. 3 S., R. 5 E. about 1-1/2 miles east of Custer, S. Dak. The property is owned by Phillip Deming of Custer and has been operated under lease to John Ross and to Kenneth Spring.

The deposit is about 60 feet long and 7 feet wide. It apparently is a composite of two small pegmatite dikes separated by schist. Both dikes, which were encountered below a flat fault 8 feet below the surface, strike about N. 75° W. and dip steeply southwest.

Pale ruby mica, most of which is badly ruled, constitutes as much as 20 to 25 percent of the pegmatite. Only a small amount of the mica is No. 1 grade.

Development is by two shafts and a small open pit. One of the shafts is 50 feet deep but is back-filled to 22 feet below the surface. The other shaft is an inclined shaft 18 feet deep. Short drifts were driven from the deeper shaft but are inaccessible.

Production in 1943-45 was 240 pounds of sheet mica. Less than 10 percent of this was No. 1 grade.

C-243, Victory (Hedman) Mine, Mica, Custer District, Custer County

The Victory claim, located in 1943 by J. M. Koch and Howard Roseberry, is in the SE1/4SW1/4 sec. 18, T. 3 S., R. 5 E. about 2 miles northeast of Custer. It was bought by the Custer Mining Account in 1943, and operated by them from 1943 to 1945. The claim is patented.

The deposit is a lenticular pegmatite about 90 feet long and 23 feet wide. A second pegmatite, which does not crop out, joins the main pegmatite below the 60-foot level. This branch is about 60 feet long and 17 feet wide on the 60-foot level but both pegmatites narrow at depth.

Most of the dike material is albite-quartz-muscovite pegmatite, which forms both a border zone and a wall zone. Accessory minerals include tourmaline, beryl, microcline, and phosphate minerals. Some of the muscovite books are 12 inches or more in diameter.

Development is by two shafts, workings on three levels, and raises to the surface. The lowest level is 120 feet below the surface. The deposit was explored with diamond-drill holes by the Bureau of Mines in 1944.

The Victory mine was the largest producer of sheet mica in South Dakota in 1944. From June 1943 to January 1945 it produced 711,221 pounds of crude mica from which was recovered 75,460 pounds of large and small sheet mica, 257,100 pounds of washer mica, and 239 tons of scrap mica. In addition about 400 pounds of beryl was recovered.

Ref: 6.

C-244, Victory No. 1 Prospect (Hofert-Arcade), Mica, Custer District, Custer County

The Victory No. 1 (Hofert-Arcade) mica prospect, held by H. L. Hofert of Custer, S. Dak., is 5 miles east of Custer in the NW1/4 sec. 16, T. 3 S., R. 5 E.

The deposit is an irregular branching pegmatite about 250 feet long that strikes N. 55° W. and dips 40° to 60° southeast. Near the southeast end the two branches are separated by 10 feet of schist.

Most of the material in the main dike is microcline-oligoclase-quartz pegmatite. Accessory minerals include muscovite and tourmaline. The mica is hard, flat, deep ruby mica, with some air stains. The branch dike is a sillimanite-quartz pegmatite with tourmaline, biotite, muscovite, and garnet.

Two small cuts constitute the development. The main cut is 20 feet long, 10 feet wide, and 8 feet deep. The second cut is 8 feet long, 6 feet wide, and 4 feet deep.

In 1943 and 1944 the mine produced about 216 pounds of trimmed punch and sheet mica valued at about $1,000.

C-245, Walsh Mica Prospect, Mica, Custer District, Custer County

The Walsh mica prospect, on the Walsh Ranch 1,000 feet north of the Earle lode, is in the SE1/4 sec. 28, T. 3 S., R. 5 E. It was discovered by Landon Landis in May 1944.

The deposit is a thin tabular pegmatite about 260 feet long. It strikes N. 70° E. and dips 50° northwest. Near the east end the pegmatite is 5 or 6 feet thick, but it narrows on the west to less than a foot.

Flat, hard, pale ruby mica is found in the central part of the pegmatite near the east end. Most of the mica is of excellent quality.

The only development is a small prospect pit in the wide part of the dike. About 75 pounds of sheet mica was produced from this pit in 1944.

C-246, Friday Lode, Feldspar,
Custer District, Custer County

The Friday lode, owned by I. W. Lanham and E. E. White, is near the center of sec. 21, T. 3 S., R. 4 E. just south of the Minnie May group (M. S. 1996). The property is on Ruby Creek, about 2-1/2 miles northwest of Custer.

The deposit is a knob-shaped pegmatite in granite and schist. It contains potash feldspar, quartz, mica, and a little tourmaline and beryl. Most of the feldspar is good quality but is iron stained.

Development is by two small opencuts in the face of the 50-foot knob. One cut is 10 feet wide, 10 feet long, and 10 feet high at the face. The second cut, higher up the face of the knob, is 10 feet long, 6 feet wide, and 8 feet high at the face.

No production is reported from the deposit.

Ref: 30, p. 63.

C-247, Independence No. 1 Lode, Feldspar,
Custer District, Custer County

The Independence No. 1 lode, owned by I. W. Lanham and E. E. White, is near the west side of sec. 21, T. 3 S., R. 4 E., at the southwest corner of the Minnie May group (M. S. 1996).

The deposit is a dikelike pegmatite in schist and granite. It contains feldspar, quartz, mica, and tourmaline. Most of the minerals are mixed.

Development is by two small cuts. One cut is 8 feet wide, 10 feet long, and 8 feet deep at the face. The second, 200 feet southeast of the first, is 10 feet wide, 6 feet long, and 10 feet deep at the face.

No production is reported from the deposit.

Ref: 30, p. 63.

C-248, Independence Lode, Feldspar,
Custer District, Custer County

The Independence lode, owned by I. W. Lanham and E. E. White, is near the southeast corner of sec. 20, T. 3 S., R. 4 E. The claim is just south of the Independence No. 1.

The deposit is a pegmatite dike in schist and granite. It contains feldspar mixed with quartz, mica, and tourmaline.

Development is by a single prospect cut. This cut is 5 feet long, 6 feet wide, and 8 feet deep at the face.

No production has been reported from the property.

Ref: 30, p. 63.

C-249, Tin Mountain Mine (M. S. 553), Feldspar, Lithium, Pollucite, Custer District, Custer County

The Tin Mountain mine, owned by the Maywood Chemical Works of Maywood, N. J., is about 7 miles west of Custer in the NE1/4 sec. 35, T. 3 S., R. 3 E. The property is a patented 9-acre claim.

The deposit is an irregular L-shaped pegmatite. One limb is about 190 feet long and 30 feet wide; the other is 280 feet long and 70 feet wide. Four types of pegmatite make up the mass. These are: (1) Coarse massive quartz; (2) coarse microcline-perthite; (3) medium-grained perthite-quartz-muscovite or albite-quartz-muscovite or quartz-muscovite; and (4) fine-grained quartz-muscovite-tourmaline. Most of the valuable minerals, which include spodumene, amblygonite, beryl, columbite, and pollucite, are in the coarser parts of the pegmatite near the center.

Development is principally by several hundred feet of underground openings in two main levels. Two large stopes above the main level have produced most of the ore mined to date, which amounts to more than 19,000 tons.

Data in regard to the tonnages of amblygonite, spodumene, and beryl shipped are not available. At least one carload of pollucite was shipped in 1928.

The mine is not operating.

Ref: 30, p. 67; 37, p. 261; 54, pp. 275, 284.

C-250, Warren Draw Mine, Feldspar, Beryl, Custer District, Custer County

The Warren Draw or Warren Gulch mine is in the NE1/4 sec. 35, T. 3 S., R. 3 E. about 6 miles west-southwest of Custer, S. Dak. The property is owned by Gladys Wells of Custer.

The deposit is a large, irregular, angle-shaped pegmatite that crops out along a ridge for about 800 feet. Four zones can be distinguished. They include a border zone of quartz-plagioclase-muscovite pegmatite, a wall zone of plagioclase-quartz-perthite-muscovite pegmatite, an intermediate zone of quartz and muscovite, and a core of perthite and quartz.

Most of the beryl is in the wall zone, associated with podlike masses of quartz. The mica is found in the three outer zones; most of the mica is suitable only for scrap.

Development is by five opencuts and a shallow inclined shaft. The main opencut is about 150 feet long, 80 to 100 feet wide, and 50 to 75 feet deep. Work in 1951 was confined to this main pit.

Production from the deposit is at least 6,000 tons of feldspar, 100 tons of scrap mica, and 2 or 3 tons of beryl.

C-251, Crown Mine (M. S. 1602), Mica, Beryl, Custer District, Custer County

The Crown mica mine, formerly known as the McMackin mine, is in the NE1/4 sec. 16, T. 3 S., R. 4 E. about 2-1/2 miles northwest of Custer. The mine workings are on the south end of the same dike as the Ballard mine. One of the oldest mica mines in South Dakota, the Crown mine is owned today by the New York Holding Co. of Custer, S. Dak.

The deposit is a pegmatite dike in an anticlinal fold that strikes northwest and dips to the south. Minerals present include feldspar, quartz, mica, beryl, and tourmaline. Most of the mica is pale to ruby mica. Part of it is air stained and some of it shows ruling and "A" structure.

Mine workings include an opencut, several old inclines, a 100-foot shaft, and numerous drifts and stopes.

Production between 1879 and 1884 was 45,000 pounds of sheet mica. Between 1941 and 1943 the mine produced 25,170 pounds of sheet, 388,260 pounds of punch, and 509,400 pounds of scrap mica. A small amount of beryl has been shipped also, but exact figures are not available.

Ref: 37, p. 70; 62, pp. 391-393.

C-252, Crain, Gold, Silver, Hill City District, Pennington County

The Crain claims lie in secs. 1 and 2, T. 1 S., R. 4 E. near the head of Burnt Fork Gulch, 5 miles northwest of Hill City. They form part of the Burlington group, M. S. 1965.

A series of thin quartz veins, seldom exceeding 5 or 6 inches in thickness, cuts the pre-Cambrian schist. According to Allsman, some free gold has been obtained by crushing and panning ore taken from shallow opencuts.

Limited development has been attempted by several shallow shafts, test pits and trenches, but no production record is available.

Ref: 1, p. 86.

C-253, Tepee Gulch Area, Gold, Silver, Pennington County

The Tepee Gulch area is about 3 miles northeast of Keystone, near the center of the S1/2 T. 1 S., R. 6 E. There was considerable placer activity in the area in the early days, and some promotional and development work was done on lode claims about 1905. Lincoln's claim map of the Keystone district shows a group of 19 patented claims in secs. 27, 28, 33, and 34.

Companies active around 1905 include the Eagle Rock and the Wealthy. The latter is reported to have owned 5 patented claims, 3 acres of placer ground, and a 20-stamp mill.

C-254, Ivanhoe District, Gold, Silver, Unorganized District, Custer County

The old Ivanhoe mining district lies 8 miles east of Custer and a similar distance south of Keystone. Most of the claims are in secs. 18 and 19, T. 3 S., R. 6 E.

Quartz veins cut pre-Cambrian schist and quartzite, but are in turn cut by pegmatite dikes associated with the Harney Peak granite. The veins range from mere seams to over 50 feet in width, but those carrying gold appear limited to less than 2 feet in thickness. The ore is milky white quartz with free gold and minute inclusions of graphite.

Most of the claims were filed in 1893. Serious development was begun in 1903, but no commercial mines materialized and activity died down about 1906. Among prospects whose names have survived are the Detroit group, with a 75-foot shaft and numerous short tunnels and stopes; the Chilkoot group, which had a 60-foot tunnel into the hillside and winze, which eventually reached a total depth from the surface of 200 feet; the Sunrise with a 20-foot shaft; and the Parrish, with one or more small openings.

During the 1903-06 period all of these properties and the Bell Weather group a mile to the south were operated by the Ivanhoe Gold Mining & Milling Co. A 10-stamp mill was built in 1904 and operated intermittently until 1906. Apparently, little gold was recovered.

Ref: 12, pp. 134-136; Black Hills Mining Review, 1903-06.

AREA D

Geology

This area lies on the south edge of the Black Hills uplift and includes parts of the adjacent plains. It comprises Tps. 4-12S., Rs.1-8E. It includes southern Custer and all of Fall River County, figure 4. It is drained by the Cheyenne River and its tributaries. The geology has been described in folios 219 (central Black Hills), 85 (Oelrichs), and 108 (Edgemont) of the Geologic Atlas of the United States (15, 17, 18).

Pre-Cambrian Rocks

The north central part of this area consists of a semicircular outcrop of pre-Cambrian metamorphic and igneous rocks. Intensely folded schists, slates, and quartzites have been intruded by the Harney Peak granite and subsequently by innumerable pegmatite dikes closely associated with the granite.

Minerals found within the area of pre-Cambrian rocks include the pegmatite minerals discussed in detail below; gold and silver in a belt west of Custer and at Ivanhoe; and marble at an old quarry northeast of Custer.

The pegmatites occur in areas partly surrounding the Harney Peak batholith. Within this area they center around Custer and Pringle. Few commercially important pegmatites have been found within the granite itself. Other pegmatites, not yet exposed by erosion, undoubtedly exist below the unconformable cover of Paleozoic rocks.

The pegmatites are believed to have been formed by magnetic differentiation of the pre-Cambrian granitic intrusions and are generally characterized by their white to gray color and the relatively large size of the individual crystals. Because of their greater resistance to weathering, they frequently form conspicuous topographic features.

Many pegmatites, where enclosed in schist, are tabular to lenticular. These are generally parallel to the schistosity in both dip and strike. In some places they are parallel in strike only. The tabular and lenticular bodies vary in width from a few inches to several hundred feet, and in length from a few feet to over 1,000 feet. Dips are usually steep, although some are flat or dip at low angles. There are tear-drop forms and most of the lenticular and tear-drop bodies have a plunge along both the crest and the keel. Other pegmatites occur as pipelike bodies that vary in cross-section from less than 100 to several hundred feet. The dip or plunge of these pipes is usually steep.

The major or essential minerals of the pegmatites are feldspar, quartz, and muscovite, as is true of almost all coarse-grained granitic pegmatites. Feldspar is probably the dominant mineral, with quartz being in almost equal quantities and perhaps more widespread throughout the deposits. Muscovite mica is the third most abundant mineral, but it is present in quantities considerably smaller than either the feldspar or quartz. The minor or accessory minerals, with the possible exception of spodumene, make up only a very small fraction of any deposit. The more important of these, from an economic standpoint, are: Spodumene, beryl, amblygonite, lepidolite, columbite-tantalite, and cassiterite.

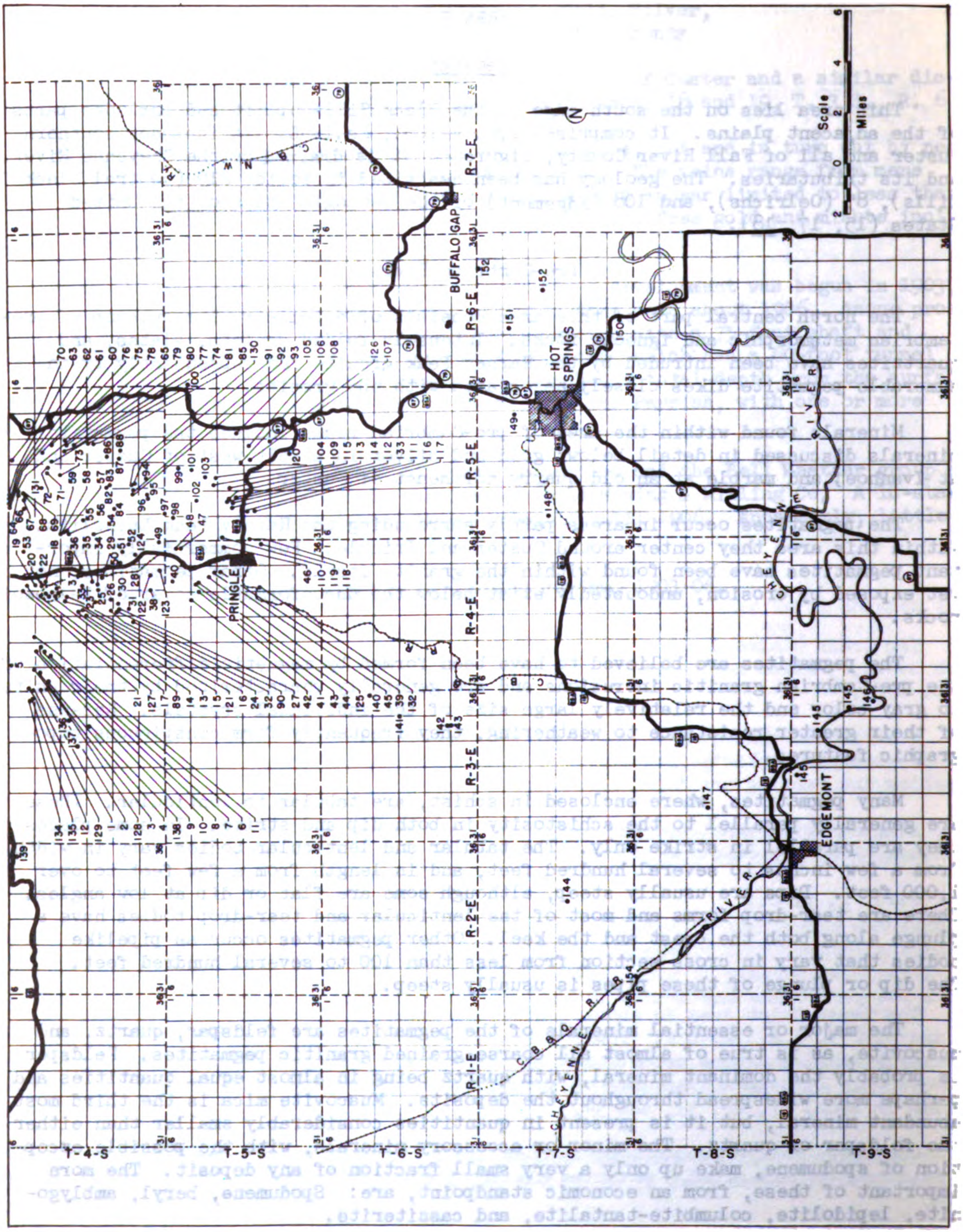

Figure 4. - Location map, area D.

The internal structure of pegmatites has been intensively studied by the Geological Survey and others (7). These detailed studies show that structurally most pegmatites follow a general sequence of units or zones, based on mineral assemblages from the wall rock inward. Many zones are imperfectly formed and are altered by later replacement and fracture filling, but the sequence of zones prevails regardless of the number present. A series of 11 zones, based on the mineral assemblages, has been established. This series has been found to prevail in the major pegmatite districts of the United States. In some districts some of the zones are missing, but the sequence of existing zones is in accordance with the series. In the southeastern States, 5 zones have been found; in the New England area, 7; and in the Black Hills, all 11 occur. It has been determined that certain economically important minerals, such as sheet mica, beryl, feldspar, and the lithia minerals occur in commercial quantities only in specific zones.

Paleozoic Rocks

Cambrian System

Deadwood formation. - The Deadwood formation consists of 4 to 100 feet of reddish brown sandstone. It crops out as a narrow band around the area of pre-Cambrian rocks, and is overlain directly by the Englewood limestone throughout the area. It may rest on either schist or granite. No commercial use has been made of the formation locally.

Ordovician System

No rocks of this age are present in the southern Black Hills.

Mississippian System

Lower Mississippian Englewood formation. - The Englewood consists of 30 to 50 feet of purplish limestone. It is very argillaceous in its lower part. It has no commercial value in this area.

Middle Mississippian Pahasapa limestone. - The Pahasapa consists of 300 to 500 feet of light-gray limestone. It forms an outcrop belt up to 5 miles wide around the southern Black Hills. It has been mined locally for aggregate and has been burned for lime at Pringle and Loring siding. At the latter station it has also been prepared for railroad ballast and for use in the manufacture of beet sugar. Many years ago an effort was made to market a lithographic stone that occurs at the top of the formation west of Custer. Artesian water is obtained from the Pahasapa at the Black Hills Ordnance Depot at Provo.

Wind Cave and Jewel Cave, both developed in the Pahasapa, have been opened to the public by the Federal government.

Pennsylvanian System

Minnelusa formation. - The Minnelusa formation consists of 700 feet or more of sandstone, limestone, dolomite, and red shale in the outcrops, and increases to over 1,200 feet in subsurface in the southwest corner of the State. It carries some artesian water and a few small oil shows have been reported in Fall River County.

Permian System

Opeche formation. - The Opeche consists of 90 to 150 feet of brick-red shale and siltstone. The thickening in this area is at the base, where up to 40 feet of cliff-forming red siltstone underlies the normal red shale sequence. It has no commercial use in the area under consideration.

Minnekahta limestone. - The Minnekahta consists of 40 to 60 feet of thin-bedded purplish limestone. It has been crushed locally for road metal and aggregate and has been burned for lime at Hot Springs. Large quantities have recently been used for riprap and retaining walls in flood-control work at Hot Springs.

Mesozoic Rocks

Triassic System

Spearfish formation. - The Spearfish consists of 350 feet of red shale and siltstone and is probably of Permo-Triassic age. Gypsum beds within the formation locally reach commercial thickness. Between the years of 1893 and 1909 this gypsum was used in the manufacture of plaster at Hot Springs.

Jurassic System

Nugget (?), Gypsum Springs, Sundance, Unkpapa, and Morrison formations. - This series reaches a thickness of up to 600 feet along the southern flank of the Black Hills. The Unkpapa sandstone, which may be pure white, red, or variegated, has been quarried for building stone in Calico, Elm, and Odell Canyons between Buffalo Gap and Hot Springs. It is generally too soft to be durable and has found some recent use as an interior decorative stone.

Cretaceous System

Lakota sandstone. - The Lakota consists of massive sandstone with some beds of shale and impure coal. It ranges in thickness from 200 feet in the western part of the area to nearly 400 feet in the vicinity of Buffalo Gap.

Seams of impure coal up to 5 feet in thickness occur in the vicinity of Edgemont. Several of these have been opened by short drifts, and some of the coal was marketed locally during the depression years. West of this area, at Cambria, 8 miles north of Newcastle, Wyo., the Lakota contains a 3- to 18-foot seam of high-volatile bituminous coal suitable for coking. The Burlington Railroad mined this coal for its own use between 1889 and 1928. All coal over 3 feet in thickness is now mined out.

Deposits of the uranium ore, carnotite, were discovered in the Lakota sandstone in Red and Craven canyons in 1951. Proper evaluation of the discovery has not yet been made.

The Lakota is a source of artesian water around the south flank of the Black Hills.

Minnewasta formation. - The Minnewasta limestone, which crops out only in this limited area, varies from 3 to 25 feet in thickness. At one time it was burned for lime near Hot Springs, but it has not been utilized for many years.

Fuson formation. - The Fuson consists of 34 to 163 feet of soft variegated clays, fire clays, and sandstone. It is not known to have been used in this area.

Dakota sandstone. - The Dakota consists of 54 to 196 feet of sandstone with thin shale partings. A massive basal member, 20 to 40 feet in thickness, has been quarried for building stone in the vicinity of Hot Springs and north of Edgemont. The product was at one time shipped as far as Omaha and Lincoln, Nebr., but the quarries are not now active. One stratum of sharp sand within the upper part of the formation was once used at Edgemont for making grindstones.

The Dakota is a consistent producer of artesian water south of the Hills.

Graneros formation. - The Graneros formation can be subdivided into the following units in this area:

	Feet
Belle Fourche shale member	300-350
Mowry shale member	200-225
Newcastle sandstone member	0-15
Skull Creek shale member	225-250

The Newcastle (Muddy) sandstone carries gas in a prominent structure north of Ardmore, but it has not been possible to develop the gas in commercial quantities. The Mowry bentonite is missing in this area.

Greenhorn formation. - This 45- to 65-foot formation consists of slabby limestone and calcareous shale. The slabs have been used by ranchers for building foundations, bridge abutments, and as riprap on stock dams.

Carlile formation. - The Carlile formation includes up to 450 feet of dark-gray, marine shale. To the west, across the Wyoming line, thin sands (Wall Creek sandstone) in the Carlile carry oil in commercial quantities. The outcrop is characterized by sandstone ridges and lines of huge limestone concretions.

Niobrara formation. - The Niobrara consists of about 200 feet of chalky marine shale. It has not been exploited in the Black Hills area.

Pierre formation. - The Pierre shale has a thickness of about 1,500 feet south of the Black Hills. A zone of bentonites occurs about 175 to 200 feet above the base in this area. One bentonite, commercially called the Ardmore bed, averages over 3 feet in thickness. It is a nonswelling clay, suitable for water softening and is marketed under the name of Refinite. It was first mined commercially at Buffalo Gap in 1915. In 1917 operations were shifted to Ardmore and have continued to the present time.

Fox Hills and Hell Creek. - These are not present south of the Black Hills, although the Fox Hills shows up as a thin, ridge-forming sandstone a short distance to the west across the Wyoming line. "Lance" beds, equivalent to the Hell Creek farther north, overlie the Fox Hills in Wyoming.

Cenozoic rocks

Fort Union. - There are no beds of Fort Union age around the south edge of the Black Hills uplift.

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Oligocene-White River. - The White River clays are best known to the southeast where erosion has carved them into intricate badlands. High terrace gravels in the northeast part of this area belong to this same formation. The gravels are used locally for road gravel, and in some places they carry enough water to supply ranch needs.

The formation includes beds of Fuller's earth, which have been prospected 2 miles west of Argyle and 5 miles southeast of Fairburn. Some shipments were made in the early days, but the product was apparently not competitive. Volcanic ash is abundant in the White River formation. Small beds are known near Argyle, and very persistent layers are known in the badlands.

A thin limestone within the formation at Limestone Butte has been quarried for building stone for local use.

Quaternary and Recent Rocks

Extensive deposits of sand and gravel lie on terraces about 100 feet above the level of the Cheyenne River. Twenty feet or more of gravel overlain by 4 to 8 feet of overburden occurs near Oral. The deposit has been worked since 1907.

Sandbars in the present channel of the Cheyenne have been utilized at Marietta on the Burlington Railroad.

Mines and Mineral Deposits

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Name	Commodity	Serial No.
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Aman lode (Francis)	do.	D-125
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Anthony prospect	Bituminous coal	D-144
Antler mine	Mica	D-87
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Argyle fuller's earth deposit	Fuller's earth	D-140
Art lode	Feldspar	D-98
Baker Plaster Co. (Grant Robinson property)	Gypsum	See D-149
Bald No. 1 lode	Feldspar	D-113
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Corky claim	do.	D-134
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Lookout mine	Feldspar, mica, beryl	D-41
Lookout No. 5 lode	Feldspar	D-28
Lost Spring lode	do.	D-86
Lucky Twist mine	Feldspar, mica, beryl	D-124
McArthur mine	Mica	D-16
Mack lode	Feldspar	D-40
Marietta Gravel deposit (Tubbs gravel pit)	Gravel, sand	D-154
Marydale prospect	Mica	D-33
Maxine lode	Feldspar, mica	D-38
May group	Gold	D-137
Mayo lode	Feldspar, beryl	D-29
McClaren mine (Red Bird mine)	Feldspar	See D-122
McKay No. 1 lode	do.	D-99
McKirahan mica prospect	Mica	D-100
Michaud prospect	Beryl, mica	D-136
Midas mine	Mica	D-36
Mitchell lode	Feldspar	D-72
Moon lode	do.	D-11
Mountain Beryl claim	Feldspar, beryl	D-43
Mountain Rose mine (Mountain Queen)	Beryl, feldspar	D-39
New York mine	Feldspar, mica	D-6
Number Nine lode	Feldspar, mica, beryl	D-71
Odel Canyon Quarry	Sandstone	D-151
Old Missouri prospect	Mica, feldspar	D-32
One Point lode	Feldspar	D-10
Payday lode	Feldspar, mica, beryl	D-45
Phenacite prospect	Feldspar, beryl	D-47
Phillip mine	Feldspar	D-54
Pigtail prospect	Mica	D-105
Pine Top Fraction lode	Feldspar, mica	D-20
Pine Top lode	do.	D-19
Pink Monster (Greene mine)	Feldspar, beryl	See D-109
Pleasant Valley mine	do.	D-3
Pot lode	Feldspar	D-83
Pringle mine	Beryl, feldspar	D-46
Punch mine (Wyoming lode)	Mica	D-90
Rainbow No. 4 claim	Feldspar, mica, beryl	D-12
Ray prospect	Mica	D-15
Red Bird lode	Feldspar	D-13
Red Bird mine (McClaren mine)	do.	D-122
Red Deer mine	Mica	D-81
Red Monster (Greene mine)	Feldspar, beryl	See D-109
Red Poppy lode	Feldspar	D-31
Red Rose No. 1 lode	Pegmatite	D-76

Alphabetical Index (Con.)

Name	Commodity	Serial No.
Red Spar mine	Feldspar, beryl	D-138
Reed mine	Feldspar	D-103
Rives lode	Feldspar, mica	D-80
Roadside mine	Feldspar	D-25
Roxy lode	Feldspar	D-55
Ruberta Mining & Milling Co.	Gold	D-5
Ruby Reef claims	Mica	D-35
Scott's Rose Quartz mine	Quartz, mica, feldspar	D-74
Seal mine	Mica	D-95
Seller's mine	Feldspar	D-51
Short lode	do.	D-14
Silver Dollar mine	Mica, beryl	D-18
Ski-High lode	Feldspar	D-115
Smith mine	do.	D-104
Sno lode	do.	D-61
Sno No. 1 lode	do.	D-63
Sno. No. 2 lode	do.	D-62
Soda Spar mine	Feldspar, beryl, mica	D-50
South lode	Feldspar	D-66
Spud lode	do.	D-82
St. Louis mine (E. L. Davis mine)	Feldspar, mica	D-70
Star lode	Feldspar	D-67
Tanner property	Beryl, columbium, tantalum, mica	D-133
Tiptop lode	Feldspar, mica	D-7
Tom Carroll claim	Feldspar, beryl	D-128
Top lode	Feldspar	D-65
Townsite lode	do.	D-118
Triangle A lode	do.	D-79
Tubbs gravel pit (Marietta Gravel Deposit)	Gravel, sand	See D-154
Tut lode	Feldspar	D-84
U. S. Gypsum Co. (Grant Robinson Property)	Gypsum	See D-149
Victory claim	Beryl, mica	D-130
Virginia Dike	Pegmatite	D-78
Virginia lode	Feldspar	D-110
Volcano lode (Eruption lode)	Mica, beryl, amblygonite	D-129
West lode	Feldspar	D-69
White Bear mine	Mica, beryl	D-22
White Cloud prospect	do.	D-121
White Elephant mine	Feldspar	D-49
White Mica lode & White Mica No. 1 lode	Feldspar, mica	D-4
Wonder lode	Feldspar, mica, beryl	D-30
Wood mine	Feldspar	D-117
Wyoming lode (Punch mine)	Mica	See D-90

Mines and Mineral Deposits

Numerical Index

Serial No.	Name	Commodity
D-1	Big Tom mine (Ken lode)	Beryl, mica, feldspar
D-2	Helen Beryl	Do.
D-3	Pleasant Valley mine	Feldspar, beryl
D-4	White Mica lode & White Mica No. 1 lode	Feldspar, mica
D-5	Ruberta Mining & Milling Co.	Gold
D-6	New York mine	Feldspar, mica
D-7	Tiptop lode	Do.
D-8	Lincoln lode	Do.
D-9	Lincoln No. 7 lode	Do.
D-10	One Point lode	Feldspar
D-11	Moon lode	Do.
D-12	Rainbow No. 4 claim	Feldspar, mica, beryl
D-13	Red Bird lode	Feldspar
D-14	Short lode	Do.
D-15	Ray prospect	Mica
D-16	McArthur mine	Do.
D-17	Hub mine	Do.
D-18	Silver Dollar mine	Mica, beryl
D-19	Pine Top lode	Feldspar, mica
D-20	Pine Top Fraction lode	Do.
D-21	Buster Dike	Mica, beryl
D-22	White Bear mine	Do.
D-23	Jack Rabbit mine	Do.
D-24	Lincoln No. 5 lode	Feldspar
D-25	Roadside mine	Do.
D-26	Lincoln No. 1 lode	Do.
D-27	Lincoln No. 6 lode	Do.
D-28	Lookout No. 5 lode	Do.
D-29	Mayo lode	Feldspar, beryl
D-30	Wonder lode	Feldspar, mica, beryl
D-31	Red Poppy lode	Feldspar
D-32	Old Missouri prospect	Mica, feldspar
D-33	Marydale prospect	Mica
D-34	Albert Lee lode	Feldspar, mica
D-35	Ruby Reef claims	Mica
D-36	Midas mine	Do.
D-37	Chipmunk No. 25 claim	Beryl, feldspar
D-38	Maxine lode	Feldspar, mica
D-39	Mountain Rose mine	Beryl, feldspar
D-40	Mack lode	Feldspar
D-41	Lookout mine	Feldspar, mica, beryl
D-42	Carroll claims	Feldspar
D-43	Mountain Beryl claim	Feldspar, beryl
D-44	Bonnie lode	Mica
D-45	Payday lode	Feldspar, mica, beryl
D-46	Pringle mine	Beryl, feldspar
D-47	Phenacite prospect	Feldspar, beryl
D-48	Henwood lode	Do.

Numerical Index (Con.)

Serial No.	Name	Commodity
D-49	White Elephant mine	Feldspar
D-50	Soda Spar mine	Feldspar, beryl, mica
D-51	Seller's mine	Feldspar
D-52	Big Bull lode	Do.
D-53	Evergreen group	Feldspar, beryl
D-54	Phillip mine	Feldspar
D-55	Roxy lode	Do.
D-56	Dike No. 2 mine	Feldspar, spodumene
D-57	Black Diamond mine	Spodumene, mica
D-58	Beecher lode	Mica, beryl, lithium
D-59	Longview (Beecher No. 2)	Spodumene
D-60	Bare Top No. 1 lode	Feldspar
D-61	Sno lode	Do.
D-62	Sno No. 2 lode	Do.
D-63	Sno No. 1 lode	Do.
D-64	High lode	Do.
D-65	Top lode	Do.
D-66	South lode	Do.
D-67	Star lode	Do.
D-68	East lode	Do.
D-69	West lode	Do.
D-70	St. Louis mine	Feldspar, mica
D-71	Number Nine lode	Feldspar, mica, beryl
D-72	Mitchell lode	Feldspar
D-73	Harry lode	Do.
D-74	Scott's Rose Quartz mine	Quartz, mica, feldspar
D-75	Haselrodt lode	Feldspar
D-76	Red Rose No. 1 lode	Pegmatite
D-77	Little Spar lode	Feldspar
D-78	Virginia Dike	Pegmatite
D-79	Triangle A lode	Feldspar
D-80	Rives lode	Feldspar, mica
D-81	Red Deer mine	Mica
D-82	Spud lode	Feldspar
D-83	Pot lode	Do.
D-84	Tut lode	Do.
D-85	Bellmare No. 1- No. 4 & Wildwood claims	Feldspar, mica
D-86	Lost Spring lode	Feldspar
D-87	Antler mine	Mica
D-88	Flynn lode	Feldspar
D-89	Helen group	Do.
D-90	Punch mine	Mica
D-91	Cat lode	Feldspar, beryl
D-92	Bet lode	Do.
D-93	H & M lode No. 5	Feldspar
D-94	Harball's mine	Do.
D-95	Seal mine	Mica
D-96	Bull Elk mine	Feldspar
D-97	Ann mine	Mica
D-98	Art lode	Feldspar
D-99	McKay No. 1 lode	Do.

Numerical Index (Con.)

Serial No.	Name	Commodity
D-100	McKirahan mica prospect	Mica
D-101	Ed lode	Feldspar
D-102	Dakota feldspar mine	Feldspar, beryl, mica
D-103	Reed mine	Feldspar
D-104	Smith mine	Do.
D-105	Pigtail prospect	Mica
D-106	Ajax claim	Do.
D-107	Apex claim	Do.
D-108	Bald No. 4 lode	Feldspar
D-109	Greene mine (Pink Monster, Red Monster)	Feldspar, beryl
D-110	Virginia lode	Feldspar
D-111	Bald No. 2 lode	Do.
D-112	Hidden Treasure lode	Do.
D-113	Bald No. 1 lode	Do.
D-114	Bald No. 3 lode	Do.
D-115	Ski-High lode	Do.
D-116	Conlon mine	Do.
D-117	Wood mine	Do.
D-118	Townsite lode	Do.
D-119	Lone Pine lode	Do.
D-120	Fanny McAdam Ranch	Do.
D-121	White Cloud prospect	Mica, beryl
D-122	Red Bird mine (McClaren mine)	Feldspar
D-123	Blue Bird lode	Feldspar, beryl
D-124	Lucky Twist mine	Feldspar, mica, beryl
D-125	Aman lode (Francis)	Feldspar, mica
D-126	LaRue mine	Mica, beryl
D-127	Bull Head and Roosevelt lodes	Do.
D-128	Tom Carroll claim	Feldspar, beryl
D-129	Volcano lode	Mica, beryl, amblygonite
D-130	Victory claim	Beryl, mica
D-131	Elk No. 1 claim	Mica, beryl
D-132	Black Hills Lime Co.	Lime
D-133	Tanner property	Beryl, columbium, tantalum, mica
D-134	Corky claim	Feldspar
D-135	Eruption claim	Do.
D-136	Michaud prospect	Beryl, mica
D-137	May group	Gold
D-138	Red Spar mine	Feldspar, beryl
D-139	Black Hills Porcelain Clay & Marble Co.	Lithographic stone
D-140	Argyle fuller's earth deposit	Fuller's earth
D-141	Case group	Manganese
D-142	C & N group	Do.
D-143	Jack Pot group	Do.
D-144	Anthony prospect	Bituminous coal
D-145	Cheyenne River prospect	Do.
D-146	Jim Hill Mine	Do.
D-147	Edgemont Quarry	Sandstone
D-148	Hot Springs Gypsum Co.	Gypsum

Numerical Index (Con.)

Serial No.	Name	Commodity
D-149	Grant Robinson property	Gypsum
D-150	Evans Quarry	Sandstone
D-151	Odel Canyon Quarry	Do.
D-152	Burke Quarry	Do.
D-153	Elm Creek Quarry	Do.
D-154	Marietta gravel deposit	Gravel, sand

Commodity Index

Gold

Name	Serial No.
May group	D-137
Ruberta Mining & Milling Co.	D-5

Amblygonite

Name	Serial No.
Volcano lode	D-129

Beryl

Name	Serial No.
Beecher lode	D-58
Bet lode	D-92
Big Tom mine	D-1
Blue Bird lode	D-123
Bull Head & Roosevelt lodes	D-127
Buster Dike	D-21
Cat lode	D-91
Chipmunk No. 25 claim	D-37
Dakota feldspar mine (Beryl Mica lode)	D-102
Elk No. 1 claim	D-131
Evergreen group	D-53
Greene mine (Pink Monster, Red Monster)	D-109
Helen Beryl	D-2
Henwood lode	D-48
Jack Rabbit mine	D-23
LaRue mine	D-126
Lookout mine	D-41
Lucky Twist mine	D-124
Mayo lode	D-29
Michaud prospect	D-136
Mountain beryl claim	D-43
Mountain Rose mine	D-39
Number Nine lode	D-71
Payday lode	D-45
Phenacite prospect	D-47
Pleasant Valley mine	D-3
Pringle mine	D-46
Rainbow No. 4 claim	D-12
Red Spar mine	D-138

Commodity Index (Con.)

Beryl (Con.)

Name	Serial No.
Silver Dollar mine	D-18
Soda Spar mine	D-50
Tanner property	D-133
Tom Carroll claim	D-128
Victory claim	D-130
Volcano lode	D-129
White Bear mine	D-22
White Cloud prospect	D-121
Wonder lode	D-30

Bituminous Coal

Name	Serial No.
Anthony prospect	D-144
Cheyenne River prospect	D-145

Columbium-Tantalum

Name	Serial No.
Tanner property	D-133

Feldspar

Name	Serial No.
Albert Lee lode	D-34
Aman lode (Francis)	D-125
Art lode	D-98
Bald No. 1 lode	D-113
Bald No. 2 lode	D-111
Bald No. 3 lode	D-114
Bald No. 4 lode	D-108
Bare Top No. 1 lode	D-60
Bellmare No. 1 - No. 4 & Wildwood claims	D-85
Bet lode	D-92
Big Bull lode	D-52
Big Tom mine	D-1
Blue Bird lode	D-123
Bull Elk mine	D-96
Carroll claims	D-42
Cat lode	D-91
Chipmunk No. 25 claim	D-37
Conlon mine	D-116
Corky claim	D-134
Dakota feldspar mine (Beryl Mica lode)	D-102
Dike No. 2 mine	D-56
East lode	D-68
Ed lode	D-101
Eruption claim	D-135
Evergreen group	D-53
Fanny McAdam Ranch	D-120
Flynn lode	D-88
Greene mine (Pink Monster, Red Monster)	D-109
Harball's mine	D-94
Harry lode	D-73

Commodity Index (Con.)

Feldspar (Con.)

Name	Serial No.
Haselrodt lode	D-75
Helen Beryl	D-2
Helen group	D-89
Henwood lode	D-48
Hidden Treasure lode	D-112
High lode	D-64
H & M lode No. 5	D-93
Lincoln lode	D-8
Lincoln No. 1 lode	D-26
Lincoln No. 5 lode	D-24
Lincoln No. 6 lode	D-27
Lincoln No. 7 lode	D-9
Little Spar lode	D-77
Lone Pine lode	D-119
Lookout mine	D-41
Lookout No. 5 lode	D-28
Lost Spring lode	D-86
Lucky Twist mine	D-124
Mack lode	D-40
Maxine lode	D-38
Mayo lode	D-29
McKay No. 1 lode	D-99
Mitchell lode	D-72
Moon lode	D-11
Mountain Beryl claim	D-43
Mountain Rose mine	D-39
New York mine	D-6
Number Nine lode	D-71
Old Missouri prospect	D-32
One Point lode	D-10
Payday lode	D-45
Phenacite prospect	D-47
Phillip mine	D-54
Pine Top Fraction lode	D-20
Pine Top lode	D-19
Pleasant Valley mine	D-3
Pot lode	D-83
Pringle mine	D-46
Rainbow No. 4 claim	D-12
Red Bird lode	D-13
Red Bird mine (McClaren mine)	D-122
Red Poppy lode	D-31
Red Spar mine	D-138
Reed mine	D-103
Rives lode	D-80
Roadside mine	D-25
Roxy lode	D-55
Scott's Rose Quartz mine	D-74
Seller's mine	D-51
Short lode	D-14
Ski-High lode	D-115

Commodity Index (Con.)

Feldspar (Con.)

Name	Serial No.
Smith mine	D-104
Sno lode	D-61
Sno No. 1 lode	D-63
Sno No. 2 lode	D-62
Soda Spar mine	D-50
South lode	D-66
Spud lode	D-82
St. Louis mine	D-70
Star lode	D-67
Tip Top lode	D-7
Tom Carroll claim	D-128
Top lode	D-65
Townsite lode	D-118
Triangle A lode	D-79
Tut lode	D-84
Virginia lode	D-110
West lode	D-69
White Elephant mine	D-49
White Mica lode & White Mica No. 1 lode	D-4
Wonder lode	D-30
Wood mine	D-117

Fuller's Earth

Argyle fuller's earth deposit	D-140

Gravel & Sand

Marietta gravel deposit (Tubbs gravel pit)	D-154

Gypsum

Grant Robinson property	D-149
Hot Springs Gypsum Co.	D-148

Lime

Black Hills Lime Co.	D-132

Lithium

Beecher lode	D-58

Lithographic Stone

Black Hills Porcelain Clay & Marble Co.	D-139

Commodity Index (Con.)

Manganese

Name	Serial No.
Case group	D-141
C & N group	D-142
Jack Pot group	D-143

Mica

Name	Serial No.
Ajax claim	D-106
Albert Lee lode	D-34
Aman lode (Francis)	D-125
Ann mine	D-97
Antler mine	D-87
Apex claim	D-107
Beecher lode	D-58
Bellmare No. 1 - No. 4 & Wildwood claims	D-85
Big Tom mine	D-1
Black Diamond mine	D-57
Bonnie lode	D-44
Bull Head & Roosevelt lodes	D-127
Buster Dike	D-21
Dakota Feldspar mine (Beryl Mica lode)	D-102
Elk No. 1 claim	D-131
Helen Beryl	D-2
Hub mine	D-17
Jack Rabbit mine	D-23
LaRue mine	D-126
Lincoln lode	D-8
Lincoln No. 7 lode	D-9
Lookout mine	D-41
Lucky Twist mine	D-124
McArthur	D-16
Marydale prospect	D-33
Maxine lode	D-38
McKirahan mica prospect	D-100
Michaud prospect	D-136
Midas mine	D-36
New York mine	D-6
Number Nine lode	D-71
Old Missouri prospect	D-32
Payday lode	D-45
Pigtail prospect	D-105
Pine Top Fraction lode	D-20
Pine Top lode	D-19
Punch mine	D-90
Rainbow No. 4 claim	D-12
Ray prospect	D-15
Red Deer mine	D-81
Rives lode	D-80
Ruby Reef claims	D-35
Scott's Rose Quartz mine	D-74
Seal mine	D-95

Commodity Index (Con.)

Mica (Con.)

Name	Serial No.
Silver Dollar mine	D-18
Soda Spar mine	D-50
St. Louis mine	D-70
Tanner property	D-133
Tip Top lode	D-7
Victory claim	D-130
Volcano lode	D-129
White Bear mine	D-22
White Cloud prospect	D-121
White Mica Lode & White Mica No. 1 lode	D-4
Wonder lode	D-30

Pegmatite

Red Rose No. 1 lode	D-76
Virginia Dike	D-78

Quartz

Scott's Rose Quartz mine	D-74

Sandstone

Burke Quarry	D-152
Edgemont Quarry	D-147
Elm Creek Quarry	D-153
Evans Quarry	D-150
Odel Canyon claim	D-151

Spodumene

Black Diamond mine	D-57
Dike No. 2 mine	D-56
Longview (Beecher No. 2)	D-59

Description of Properties

D-1, Big Tom Mine (Kem Lode), Feldspar, Beryl, Mica, Custer District, Custer County

The Big Tom mine, also known as the Kem lode, is about 7 miles southwest of Custer in the NW1/4 sec. 7, T. 4 S., R. 4 E. The property, which consists of two unpatented claims, is owned by F. Michaud, P. Hibbard, and M. Huemphreus of Custer, S. Dak. The Consolidated Feldspar Corp., Trenton, N. J., has a lease on the mine.

The principal feature of the deposit is the outcrop, a prominent knob about 150 feet long and 50 to 75 feet wide, which rises 70 feet above a valley floor. It strikes northeast and is vertical.

For about 30 feet above the valley floor the deposit is mainly pink microcline, with massive quartz, biotite, and muscovite. From a height of 30 feet to the top of the outcrop, the material is mostly granite. A large amount of the feldspar is so intergrown with biotite and tourmaline that clean mining is not possible. The muscovite is localized in pockets. Associated minerals include quartz, albite, and minor amounts of beryl.

Most of the mica is air stained, and some of it is intergrown with small tourmaline crystals. "A" structure is common.

The beryl is relatively pure. In the lower part of the deposit, beryl crystals range from 3/4 inch to 4 inches in diameter; in the overlying granite the crystals seldom are larger than 1/2 inch in diameter.

Development consists of one large opencut and several small cuts; these are all on the south end of the outcrop. The main cut is 50 feet long, 15 feet wide, and 30 feet deep. About 30 percent of the material mined in the cut is soda spar, which is sorted and shipped.

Ref: 30, p. 69.

D-2, Helen Beryl, Beryl, Mica, Feldspar,
Custer District, Custer County

The Helen Beryl claim is in the NW1/4 sec. 7, T. 4 S., R. 4 E. about 8 miles southwest of Custer, S. Dak. The claim, comprising about 20 acres, is owned by L. H. Jeffries of Custer. It is unpatented.

The main pegmatite at the Helen property is a lenticular mass about 250 feet long and 130 feet wide that strikes north and dips about 70° to the west. Country rock adjacent to the pegmatite is quartz-mica schist of pre-Cambrian age.

Economic minerals in the Helen Beryl pegmatite include beryl, mica, and microcline. The beryl crystals, which are white, yellow, or greenish, range less than 1 inch to as much as 12 inches in length. The average grade of freshly broken pegmatite is 0.35 percent beryl.

Most of the microcline is massive; crystals and masses several feet in diameter are common. Mica is found only along the contact between the pegmatite and the schist in a mica-rich zone a foot or two thick. Nearly all of this mica is too heavily stained for strategic mica, but a small amount of sheet mica could be recovered as a byproduct of beryl-feldspar mining. Mica suitable for scrap is plentiful.

Reserves are not known exactly, but at least 100,000 tons of pegmatite has been developed above a crosscut about 130 feet below the outcrop.

Ref: 26, pp. 1-14.

D-3, Pleasant Valley Mine, Feldspar, Beryl,
Custer District, Custer County

The Pleasant Valley mine, owned by C. A. Parker, is in the NE1/4 sec. 7, T. 4 S., R. 4 E. about 5 miles southwest of Custer, S. Dak.

Development consists of one large cut, several small cuts, and a shallow shaft in a long, wide pegmatite dike. The main opencut is about 80 feet long, 12 feet wide, and 55 feet deep at the upper end.

The pegmatite is chiefly feldspar and quartz. Beryl, in scattered crystals that range from 1/2 inch to 12 inches in diameter, is found in a wall zone 6 to 8 feet thick on the borders of the dike. Most of the beryl is relatively pure, but the small average size of the crystals, less than 2 inches, precludes sorting. A small amount of scrap mica is associated with the beryl, together with traces of tantalite. Neither is present in commercial amounts.

Most of the feldspar is in the central core of the dike. This core is about 15 feet wide; the dike itself ranges from 45 feet to 150 feet in width.

D-4, White Mica Lode and White Mica No. 1 Lode, Feldspar, Mica, Custer District, Custer County

The White Mica lode and the White Mica No. 1 lode are adjoining claims near the center of sec. 7, T. 4 S., R. 4 E. about 6-1/2 miles southwest of Custer, S. Dak. Both claims are owned by the Consolidated Feldspar Corp., Trenton, N. J.; neither is patented.

Two feldspar dikes are exposed on the property, one on each claim. Most of the work has been done on the White Mica claim, where a dike about 20 feet thick has been explored with 2 opencuts and a shallow shaft. The larger of the 2 cuts is 40 feet long, 12 feet wide, and 12 feet deep.

The dike on the White Mica No. 1 claim has been prospected by a small opencut 25 feet long, 10 feet wide, and 4 feet deep.

Both dikes are chiefly feldspar intermixed with quartz, mica, and tourmaline. Most of the mica is suitable only for scrap mica.

Total production is not known but undoubtedly is small. No shipments have been made from the White Mica No. 1.

Ref: 30, p. 77.

D-5, Ruberta Mining & Milling Co., Gold, Custer District, Custer County

The Ruberta group is near the northwest corner of sec. 5, T. 4 S., R. 4 E. about 4 miles southwest of Custer. The early history of the deposit is obscure, but it probably was discovered about 1880. It was known first as the Old Charlie, but was taken over about 1900 by the Ruberta Mining & Milling Co. A 20-stamp mill was erected to treat the ore, and in 1909 a cyanide unit was added.

The deposit is a vein composed of stringers and lenses of quartz in schist and slate. It strikes N. 45° W. The dip is almost vertical.

Recorded production in the early days is $7,500 from 1,000 tons of ore. Several thousand tons mined in shallow stopes by lessees at a later date are reported to have averaged more than $10 a ton. An opencut, 100 feet long, 15 feet wide, and 8 to 20 feet deep, is reported to have produced several thousand tons of ore. The shallow stopes were reached through a 180-foot inclined shaft, which is inaccessible today.

Ref: 1, p. 137.

D-6, New York Mine, Mica, Feldspar, Custer District, Custer County

The New York mica mine is just east of the center of sec. 18, T. 4 S., R. 4 E. about 7 miles southwest of Custer. The extent of the property is not known; 1 small claim, 300 by 1,500 feet, is patented. The property is owned by the New York Mine Corp., Denver, Colo.

First operated in 1879 or 1880, the New York mine has been one of the outstanding mica mines in the United States. From 1905 to 1911 it was owned and operated by the Westinghouse Electric & Manufacturing Co. and is still known locally as the Westinghouse No. 1.

Mine workings include a 307-foot shaft, about 2,000 feet of drifts, and 480 feet of crosscuts. More than 130,000 square feet of the vein has been stoped. Most of the stoping was done along the hanging wall, but near the surface both footwall and hanging wall zones were mined. The principal levels are at 100 feet, 200 feet, and 300 feet.

The deposit is a complex pegmatite dike about 650 feet long and 40 feet wide on the surface. It strikes northwest and dips 45° SW. The dike narrows about 8 feet in each 100 feet of depth and may, therefore, pinch out about 200 feet below the 300-foot level, where it is only 15 feet wide.

Mica has been the principal mineral produced at the New York mine. Sheet mica, in books as large as 3 feet in diameter, was found in the wall zone on both the footwall and the hanging wall. This zone on the footwall averaged about 5 feet in thickness; on the hanging wall the average thickness was about 4 feet.

From 0.25 percent to 0.50 percent of the wall zone material is beryl, which contains numerous inclusions that would make recovery difficult.

Total production is not known. Nearly 6,000 pounds of sheet mica was produced between 1880 and 1884, and the Westinghouse Co. maintained production at a high rate. More than 2,000 pounds of sheet mica and nearly 9,300 pounds of punch mica was produced in 1943.

Ref: 12, pp. 251-252; 36, pp. 202-203; 37, p. 76; 62; 63, pp. 292-295.

D-7, Tip Top Lode, Feldspar, Mica, Custer District, Custer County

The Tip Top lode is in the NE1/4SW1/4 sec. 8, T. 4 S., R. 4 E. about 5 miles southwest of Custer, S. Dak. The property consists of one unpatented claim, which is owned by W. Nevin of Custer.

The Tip Top pegmatite is a large, crescent-shaped body that strikes northwest and dips 40° SW. Most of the dike is feldspar, but small amounts of muscovite mica, beryl, and amblygonite are found near the contact, chiefly along the hanging wall. The country rock is schist.

Appreciable amounts of feldspar have been shipped from the property. Most of this feldspar came from a large opencut, which is 150 feet long, 40 to 50 feet wide, and 40 feet deep at the end. About 30 percent of the material broken was sorted and shipped.

In 1943 two small opencuts were driven north of the main pit to prospect for mica. The 2 cuts are about 50 feet apart. In the cut farthest to the north, which is about 35 feet long and 15 feet deep, a shaft was sunk about 35 feet in 1944. Short drifts were driven along the hanging wall from this shaft. Some mica was produced from these openings, together with a small amount of beryl.

Total production probably is close to 10,000 tons of feldspar, 300 pounds of sheet mica, 30 tons of scrap mica, and 1 ton of beryl.

Ref: 30, pp. 58-59; 36, pp. 202-203; 37, p. 82.

D-8, Lincoln Lode, Feldspar, Mica, Custer District, Custer County

The Lincoln lode is in the NE1/4 sec. 8, T. 4 S., R. 4 E. about 5 miles southwest of Custer. The property, which consists of one unpatented claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is an inclined tabular dike consisting largely of pink microcline and quartz. Some of the feldspar is pure but most of it is intermixed with quartz. Considerable mica, most of it suitable only for scrap mica, is found along the contact between the dike and the country rock.

Development consists of one small opencut near the south end of the dike. This cut is about 30 feet long, 10 feet wide, and 20 feet deep at the end.

No production is recorded from the property.

Ref: 30, p. 75.

D-9, Lincoln No. 7 Lode, Feldspar, Mica, Custer District, Custer County

The Lincoln No. 7 lode is in the SE1/4 sec. 5 and the NE1/4 sec. 8, T. 4 S., R. 4 E. about 5 miles southwest of Custer. The property consists of a single unpatented claim owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. The dike is composed largely of pink microcline and quartz, but contains minor amounts of mica and tourmaline. Some of the feldspar is clean, but most of it is intermixed with quartz. The mica, which is most plentiful near the contact between the dike and the country rock, is suitable only for scrap mica.

Development consists of a single small opencut about 15 feet long and 6 feet wide. The face of the cut is about 4 feet high and contains an inclusion of schist.

No production is reported from the property.

Ref: 30, p. 77.

D-10, One Point Lode, Feldspar, Custer District, Custer County

The One Point lode is in the NE1/4 sec. 8, T. 4 S., R. 4 E., about 4-1/2 miles southwest of Custer, S. Dak. The property, which consists of one unpatented claim, is on the Lindstrom ranch. The owner is Charles Rosebury of Custer.

The deposit is a pegmatite dike in schist. An unusual feature of the dike is a quartz "cap" below which is found the usual pegmatite minerals - feldspar, mica, and tourmaline. A small amount of lithiophylite is present.

Exploration workings at the One Point lode include three small opencuts and a shallow shaft.

No production has been recorded from the property.

Ref: 30, p. 59.

D-11, Moon Lode, Feldspar,
Custer District, Custer County

The Moon lode is in the SW1/4 sec. 4, T. 4 S., R. 4 E. about 4-1/2 miles southwest of Custer, S. Dak. The claim is one of several unpatented claims in the area owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. Most of the material in the dike is pink microcline. Subordinate amounts of quartz, mica, and tourmaline are present.

Development is by a small cut 12 feet long, 8 feet wide, and 8 feet deep.

No production is recorded from the property, which is idle today.

Ref: 30, p. 75.

D-12, Rainbow No. 4 Claim, Feldspar, Mica, Beryl,
Custer District, Custer County

The Rainbow No. 4 claim is in the SW1/4 sec. 6, T. 4 S., R. 4 E. about 5-1/2 miles southwest of Custer, S. Dak. The claim is unpatented and is owned by the Consolidated Feldspar Corp., Trenton, N. J.

Two good-sized dikes have been developed on the claim. Both dikes are composed principally of pink feldspar with subordinate amounts of quartz, mica, and beryl.

The large dike is made up of three zones. The wall zone is about 8 feet thick and contains pink albite, quartz, mica, perthite, tourmaline, and garnet. Mica amounts to about 10 percent of the zone. Most of the mica shows "A" structure and air staining, but some sheet mica can be sorted. About 60 percent of the zone is feldspar.

The intermediate zone, about 10 feet thick, contains from 10 to 20 percent mica and from 1 to 2 percent beryl. Most of the beryl crystals are small, but as much as 50 percent can be hand sorted. Almost all of the feldspar shipped from the property has come from the intermediate zone. The core of the dike is perthite and quartz.

Development consists of two small cuts, one in each dike.

Production is not known exactly; in 1940 about 1 ton of beryl, 5 tons of mica, and 100 tons of feldspar were shipped.

D-13, Red Bird Lode, Feldspar,
Custer District, Custer County

The Red Bird lode is one of several claims in the Custer area with the same name. This Red Bird property is owned by the Consolidated Feldspar Corp., Trenton, N. J., and is located near the SW corner of sec. 15, T. 4 S., R. 4 E. The claim extends into section 16 on the west and into section 22 on the south.

The principal feature of the property is a pegmatite dike about 900 feet long that extends 15 feet above the surface of the ground. It strikes northwest and ranges in width from 25 to 60 feet.

Most of the minerals in the dike are intermixed. The dike contains flesh-colored feldspar, quartz, scrap mica, tourmaline, garnet, and a few beryl crystals. Some of the beryl crystals show traces of tantalite.

Two small cuts have been driven to explore the deposit. One of these, near the north end of the dike, is 12 feet long, 7 feet wide, and 3 feet deep. The other cut is about 275 feet south of the north end of the dike, and is 15 feet long, 15 feet wide, and 6 feet deep.

No production is listed from the property.

Ref: 30, p. 89.

D-14, Short Lode, Feldspar,
Custer District, Custer County

The Short lode is in the SW1/4 sec. 15, T. 4 S., R. 4 E. about 5 miles south-southwest of Custer. The property is unpatented and is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It contains feldspar, quartz, mica, and tourmaline. Some of the feldspar is of good quality, but most of it is mixed with other minerals.

Development consists of a single, small opencut about 10 feet long and 5 feet wide. The floor of the opencut is in schist but whether the pegmatite continues downward has not been determined. On one side of the cut the feldspar and quartz are segregated into blocky masses, but otherwise they are mixed.

No production has been reported from the deposit.

Ref: 30, p. 89.

D-15, Ray Prospect, Mica,
Custer District, Custer County

The Ray mica prospect is in the SW1/4 sec. 15, T. 4 S., R. 4 E. about 5 miles southwest of Custer and about 1 mile northwest of the Sanator siding on the Chicago, Burlington, & Quincy Railroad.

The property consists of a single unpatented claim, which was located in July 1943 by Louis Stratton and Francis Michaud of Custer. Stratton and Michaud sold the claim to L. R. Jeffries, also of Custer, in April 1944.

Workings consist of two small opencuts in a pegmatite dike. The dike, about 100 feet long and 8 feet wide, strikes northwest and dips steeply southwest. Most of the dike material is quartz and feldspar, but muscovite mica, in books up to 8 inches in diameter, is distributed throughout the dike. Minor amounts of biotite, tourmaline, garnet, and apatite are associated with the mica.

The mica is dark ruby and is unusually hard. Part of it is badly reeved and air stained and may contain inclusions of biotite.

About 165 tons of pegmatite from the 2 opencuts contained 88 pounds of sheet mica.

D-16, McArthur Mine, Mica, Custer District, Custer County

The McArthur mica mine is in the NE1/4 sec. 15, T. 4 S., R. 4 E. about 4-1/2 miles southwest of Custer. The deposit probably was first opened shortly after 1900, but little or no work was done from that time until 1943. From 1943 to 1945 the mine was operated by several groups of lessees. The present owners are Walter Wright and Francis Michaud of Custer.

The McArthur deposit is an elongated pegmatite dike that crops out for about 320 feet as a low ridge. It strikes northwest and dips about 50° SW. Two zones are recognized in the dike. A wall zone from 2 to 5 feet thick is present on both the footwall and the hanging wall. This zone is composed of albite, quartz, and mica. The core of the dike, present only where the dike is thick, consists of perthite and quartz.

Most of the mica is in books several inches in diameter. It usually is pale to dark ruby mica and generally is of good quality. An occasional beryl crystal is also found in the wall zone, together with minor amounts of tourmaline and garnet.

Development includes a 52-foot inclined shaft from which short drifts have been driven, and an opencut. Small stopes have been mined above the drifts.

Total production is not known but probably is over 1,000 pounds of sheet mica. A small amount of beryl may have been shipped as well.

Ref: 62, p. 394.

D-17, Hub Mine, Mica, Beryl, Custer District, Custer County

The Hub mine is in the NE1/4 sec. 10, T. 4 S., R. 4 E. about 4 miles south-southwest of Custer. The early history is obscure, but mica has been mined sporadically at the property for many years.

A series of parallel pegmatites separated by schist make up the lode, which is about 25 feet wide and more than 100 feet long. The lode strikes N. 15° W. and dips 50° NE.

Most of the mica is found in a 2-foot zone on the hanging wall of the lode, but some mica is scattered throughout the pegmatite. Accessory minerals in the mica zone include plagioclase and quartz, with minor amounts of beryl.

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Development includes both surface pits and underground workings. Most of the underground workings are along the hanging wall of the pegmatite. They were filled after mining and are inaccessible today.

Total production is unknown. Several hundred pounds of mica and a small amount of beryl were shipped in 1943. No production has been reported since that time.

D-18, Silver Dollar Mine, Mica, Beryl, Custer District, Custer County

The Silver Dollar mine is in the NW1/4 sec. 11, T. 4 S., R. 4 E. about 4-1/4 miles south-southwest of Custer. The property is owned by the Custer Mining Account, which purchased it in 1946 from S. T. Gamber of Custer. Gamber located the mine in 1942 and operated it until 1944.

The deposit is a lenticular pegmatite about 15 feet wide and nearly 300 feet long. Zoning is pronounced; the border and wall zones are composed of oligoclase, perthite, and muscovite, and the core is perthite and quartz. The pegmatite strikes N. 20° W. and dips 50° SW.

Books of hard, flat, deep ruby mica are found along the contact between the border zone and the core of the pegmatite. Most of the books are small; few are larger than 6 inches square. The mica-bearing zone, several feet in width, extends into both the border zone and the core.

Development includes an opencut about 100 feet long, 20 feet wide, and 20 feet deep; a 70-foot inclined shaft; several small drifts and raises; and a few stopes.

Production between 1942 and 1944 was 3,000 pounds of sheet mica and 9,500 pounds of punch mica. Additional production during 1946 by the Custer Mining Account totaled slightly more than 1,000 pounds. About 200 pounds of this was sheet mica; the remainder was punch or washer mica.

Ref: 40, pp. 18-25.

D-19, Pine Top Lode, Feldspar, Mica, Custer District, Custer County

The Pine Top lode is in the SW1/4 sec. 2, T. 4 S., R. 4 E. about 3 miles southwest of Custer. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J., and is unpatented.

The deposit is a lenticular pegmatite about 10 feet wide and 260 feet long. Most of the pegmatite is feldspar intermixed with quartz, mica, and tourmaline. The dike strikes north and dips steeply west.

Development consists of 2 small opencuts about 10 feet long and 6 or 7 feet deep. Neither is more than a prospect opening.

Production from the 2 prospect openings totals 5 tons of crude mica and a small amount of feldspar.

Most of the mica is hard, ruby mica of good quality, although some of it is slightly air stained. The books are small, rarely exceeding 3 by 5 inches in size.

Ref: 30, pp. 84-85.

D-20, Pine Top Fraction Lode, Feldspar, Mica, Custer District, Custer County

The Pine Top fraction lode is in the NW1/4 sec. 11, T. 4 S., R. 4 E., about 3-1/4 miles southwest of Custer. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike composed of feldspar intermixed with quartz, mica, and tourmaline. Its exact size has not been determined, but the average width is about 10 feet.

Development consists of a few shallow prospect trenches and two small surface cuts. One of the cuts is 8 feet long, 12 feet wide, and 8 feet deep; the other is 15 feet long, 7 feet wide, and 5 feet deep. No production is recorded from either cut, and it is doubtful if either feldspar or mica of commercial grade have been produced from the deposit.

Ref: 30, p. 85.

D-21, Buster Dike, Mica, Beryl, Custer District, Custer County

The Buster dike mica mine is near the W 1/4 corner of sec. 2, T. 4 S., R. 4 E. about 3 miles southwest of Custer. The early history is obscure, but the deposit was prospected and partly developed many years ago. S. T. Gamber of Custer relocated two claims in 1939; these comprise the property at the present time.

The exact size and shape of the Buster pegmatite is not known. Most of the workings are in a large mass of steeply dipping quartz-albite-microcline pegmatite that is from 30 to 40 feet wide and 750 feet long.

Most of the mica produced from the property came from a zone on the hanging wall near the south end of the dike. The mica is light or pale ruby in color and generally is of good quality. Books 8 to 12 inches in size are common; books up to 4 feet have been reported. Beryl crystals up to 6 inches in diameter were reported near the surface of the dike but are rare or missing in the lower levels.

The principal development is a 180-foot inclined shaft from which levels were driven at 103 feet and at 142 feet. Most of the mica produced came from stopes on these levels; in all probability the mica-bearing rock has been mined down to the bottom level.

Total production is at least 600 tons of crude mica. Figures on processed mica produced before December 1942 are not available, but from December 15, 1942, to January 1, 1944, some 384 tons of crude mica yielded 17,500 pounds of large sheet mica, 2,300 pounds of small sheet mica, and 97,000 pounds of punch mica. In addition to the mica, at least 10 tons of beryl has been shipped from the mine.

Ref: 40, pp. 26-36.

D-22, White Bear Mine, Mica, Beryl,
Custer District, Custer County

The White Bear mine is in the NE1/4 sec. 11, T. 4 S., R. 4 E. about 3 miles south of Custer. The property, consisting of one unpatented claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J., and is leased to Minndak Mines, Inc., of Minneapolis, Minn.

The deposit is a large knoblike mass of pegmatite. Roughly lenticular in plan, it ranges from a few feet in thickness at the ends to about 80 feet near the center and is about 200 feet long.

Zoning is not distinct, but most of the mica is found near the walls in a quartz-albite-perthite border about 1 foot thick. The center of the pegmatite is largely quartz.

Development consists of a large opencut 50 feet long, 40 feet wide, and 25 feet deep; two small opencuts; a 76-foot inclined shaft; several short drifts from the shaft; and a few small stopes.

Total production is not known, but, in the 6 months between November 1943 and May 1944, some 74,000 pounds of crude mica was sold. Of this, about 1,600 pounds was sheet mica, and two-thirds of the sheet was larger than 1-1/4 by 1-1/4 inches. Most of the rest of the mica was scrap mica.

Production of beryl and feldspar is not recorded.

Ref: 40, pp. 4-18.

D-23, Jack Rabbit Mine, Mica, Beryl,
Custer District, Custer County

The Jack Rabbit mine is in the NE1/4 sec. 22, T. 4 S., R. 4 E. about 1 mile west of Sanator siding on the Chicago, Burlington, & Quincy Railroad and about 5-1/2 miles southwest of Custer. The property consists of two overlapping unpatented claims and is owned by Francis and Abram Duncan.

The principal pegmatite at the Jack Rabbit mine is from 7 to 10 feet thick. Two zones are present: A quartz-albite-perthite-muscovite wall zone and a quartz-pegmatite core. Muscovite, in books up to 10 or 12 inches in diameter, is found throughout the wall zone, but is more common in rolls on the footwall and hanging wall.

Development includes both surface and underground workings. The main surface opening is a pit 90 feet long, 10 feet wide, and 7 feet deep. This was driven between the quartz core and the hanging wall. Underground workings consist of a 54-foot vertical shaft and levels at 38 feet and 54 feet. About 90 feet of drift was driven on each of the two levels, and most of the mica-bearing rock was stoped to the surface.

Production of mica between May 1943 and March 1944 totaled 3,535 pounds. Of this, 1,647 pounds was sheet mica and 1,888 pounds was punch mica. Nearly 100 pounds of beryl was produced in 1942 from the opencut.

Ref: 39, pp. 14-18.

D-24, Lincoln No. 5 Lode, Feldspar, Custer District, Custer County

The Lincoln No. 5 lode is in the SW1/4 sec. 22, T. 4 S., R. 4 E. about 1-1/2 miles west of Mayo in Custer County. The property is owned by the Consolidated Feldspar, Corp., Trenton, N. J., and is unpatented.

The Lincoln No. 5 claim is one of several claims in the area partly developed by the Consolidated Feldspar Corp. Little or no feldspar has been shipped from any of them, and the work in general consists of shallow prospect cuts. At the Lincoln No. 5 the cut is about 8 feet long, 8 feet wide, and 8 feet deep.

Material exposed in the cut is pink feldspar mixed with quartz, mica, and tourmaline. The mica is suitable only for scrap mica, and most of the feldspar is so intermixed with the other minerals that it is not commercially important.

Ref: 30, p. 76.

D-25, Roadside Mine, Feldspar, Custer District, Custer County

The Roadside mine is about 7 miles south of Custer in the NW1/4 sec. 23, T. 4 S., R. 4 E. near the W 1/4 corner of the section. Part of the claim extends into sec. 22 on the west. The property, owned by the F. E. Schundler Feldspar Co., is unpatented.

Development at the property consists of 2 cuts on a large dike that is at least 1,500 feet long and from 25 to 100 feet wide. Two parallel smaller dikes, which lie east of the main dike, have not been explored. Both cuts in the large dike are about 15 feet wide, 25 feet long, and 15 feet deep.

Part of the feldspar in the large dike is of excellent grade, but most of it is so mixed with tourmaline as to be valueless. Considerable quartz and mica also are present.

Total production from the property is not known but undoubtedly is small.

Ref: 30, p. 39.

D-26, Lincoln No. 1 Lode, Feldspar, Custer District, Custer County

The Lincoln No. 1 lode is in the SE1/4 sec. 22, T. 4 S., R. 4 E. about 7 miles south of Custer and about 1 mile west of Mayo Station. The property, which is unpatented, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It strikes northerly and dips steeply west. A large part of the dike material is good quality red or blue feldspar, but some of it is mixed with quartz, stringers of mica, and tourmaline.

Development consists of a single opencut about 12 feet long and 10 to 20 feet wide. The cut was driven through the dike. No production is reported from the prospect.

Ref: 30, p. 75.

D-27, Lincoln No. 6 Lode, Feldspar, Mica, Custer District, Custer County

The Lincoln No. 6 lode is in the NW1/4 sec. 27, T. 4 S., R. 4 E. about 7-1/2 miles southwest of Custer. The property, which is only a prospect, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It contains feldspar, quartz, mica, and tourmaline. Most of the mica is found in stringers, and some of it is of good quality. A small amount of beryl also is present, and a few pounds have been sorted and sold.

Development consists of a single opencut about 20 feet long, 8 feet wide, and 6 feet deep. Schist country rock is exposed for 10 feet on one wall of the cut, as well as near the middle of the cut at the face.

Little or no production is reported from the prospect except for the few pounds of beryl noted above.

Ref: 30, pp. 76-77.

D-28, Lookout No. 5 Lode, Feldspar, Custer District, Custer County

The Lookout No. 5 lode is in the NW1/4 sec. 27, T. 4 S., R. 4 E. about 6-1/2 or 7 miles southwest of Custer. The property consists of one unpatented claim and is owned by the Consolidated Feldspar Corp., Trenton, N. J. Consolidated bought the property from the discoverers, Fred Heidepriem and Floyd Heman of Custer.

The principal feature of the property is the deposit, a dike of pink granite and coarse pegmatite. Scaly mica and numerous garnets are accessory minerals, together with quartz and tourmaline. Beryl, in crystals as large as 2 inches in diameter, is present locally; the beryl would be a byproduct if feldspar could be produced in commercial amounts.

Development consists of a single opencut about 6 feet wide. The cut is 12 feet long and about 6 feet deep.

Production figures are not available, but a small amount of feldspar has been shipped from the property.

Ref: 30, p. 88.

D-29, Mayo Lode, Feldspar, Beryl, Custer District, Custer County

The Mayo lode is near the center of sec. 23, T. 4 S., R. 4 E. about 1-1/2 miles northwest of Mayo station in Custer County. The property is owned by H. E. Brown of Custer.

The deposit consists of a series of parallel pegmatite dikes in schist. Potash feldspar, quartz, and mica are the principal minerals in the dikes. Other minerals present include tourmaline, beryl, and columbite-tantalite. Most of the dikes are narrow.

Development includes an opencut about 6 feet wide that has been driven 30 feet along one of the dikes. When the cut was first opened about half of the material broken was feldspar. Later, only one-fourth of the material could be sorted and shipped.

Nearly 15 tons of feldspar had been shipped from the property by 1939. Small amounts of mica, beryl, and columbite-tantalite also were sorted and sold locally. Later production figures are not available.

Ref: 30, p. 54.

D-30, Wonder Lode, Feldspar, Mica, Beryl, Custer District, Custer County

The Wonder lode is in the NE1/4 sec. 27, T. 4 S., R. 4 E. about 6 miles south of Custer and about 1 mile west of Mayo school in Custer County. Before 1943 the property was owned by Harold Duncan of Custer who sold it in 1944 to William Quinn.

The Wonder lode pegmatite is a lenticular mass about 480 feet long and as much as 50 feet wide. It strikes northwest and dips steeply southwest. The pegmatite is distinctly zoned with wall and border zones of quartz-plagioclase-muscovite pegmatite and a center zone of perthite with masses of rose quartz or intergrowths of quartz, albite, muscovite, and beryl. Inside the wall zone is a concentration of mica in books up to 3 feet thick. The mica is air stained and has many mineral inclusions. Most of it is only fair in quality. From 0.5 to 1 percent of the pegmatite is beryl, which occurs in crystals up to 6 inches in diameter. Most of the crystals are so small, however, that the beryl can be recovered only by milling.

Development consists of an open pit along the strike of the pegmatite. This pit is about 155 feet long, 25 feet wide, and as much as 30 feet deep.

Total production is not known. At least 5 or 6 tons of beryl has been shipped from the property, and reserves of feldspar, beryl, and mica are considerable.

D-31, Red Poppy Lode, Feldspar, Custer District, Custer County

The Red Poppy lode is in the SW1/4 sec. 27, T. 4 S., R. 4 E. about 7 miles southwest of Custer. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in granite. It contains pink feldspar mixed with quartz, stringers of mica, and a small amount of tourmaline. Little is known of the exact size of the pegmatite, but it probably is rather narrow.

Development consists of a single small opencut about 8 feet wide, 10 feet long, and as much as 10 feet deep. No production is recorded from the cut, which was made to satisfy the requirements for annual labor on an unpatented claim.

Ref: 30, p. 88.

D-32, Old Missouri Prospect, Feldspar, Mica, Custer District, Custer County

The Old Missouri prospect is in the SE1/4 sec. 28, T. 4 S., R. 4 E. about 4-1/2 miles northwest of Pringle, Custer County. The prospect is owned by Mrs. L. L. Perris of Hillsborough, Oreg.

The property was opened and worked first for feldspar by John Ross in 1942. In 1943 and 1944 about 200 pounds of sheet mica was produced and sold.

The main pegmatite is a large, irregular branching mass that ranges in width from 10 feet to as much as 250 feet. Most of this pegmatite is fine-grained granitic material composed of perthite, quartz, muscovite, tourmaline, biotite, and albite. Deep ruby mica, in books up to 12 inches in diameter, is found along the edges of parts of the pegmatite. Most of the mica is badly tangled, and the percentage of sheet and punch mica is low. The 200 pounds of sheet mica produced in 1943-44 came from 250 to 300 tons of pegmatite.

Development includes an open pit 60 feet long, 25 feet wide, and 15 feet deep; 2 small pits south of the main pit; and 4 cuts north of the main pit.

Total reserves are not known. Parts of the deposit contain as much as 25 percent clean feldspar in blocky crystals up to 2 feet in diameter.

D-33, Marydale Prospect, Mica, Custer District, Custer County

The Marydale mica prospect is in the SW1/4 sec. 14, T. 4 S., R. 4 E. about 5 miles south of Custer. The property is owned by Art Young of Custer.

Three pegmatites crop out on the claim. They strike N. 20° W. and dip 60° to 80° southwest. Only the most northerly pegmatite contains sheet mica. This pegmatite is about 70 feet long and 6 to 14 feet wide.

The pegmatites are composed of quartz, microcline, and muscovite. In two of the pegmatites the muscovite is distributed throughout in small books or clusters. Books of mica large enough to produce sheet mica are found only in the north pegmatite. The books average about 4 inches in diameter. When fresh the mica is pale ruby mica, but much of it is air stained, ruled, and badly reeved. Minerals associated with the mica include biotite, apatite, and tourmaline.

Mine workings consist of an opencut 70 feet long, 10 feet wide, and 20 feet deep; and 2 smaller cuts or pits. About 500 tons of pegmatite from the opencut produced 3-1/4 tons of crude mica. This crude mica yielded about 250 pounds of small sheet (less than 1-1/2 by 2 inches).

D-34, Albert Lee Lode, Feldspar, Mica, Custer District, Custer County

The Albert Lee lode is in the NW1/4 sec. 23, T. 4 S., R. 4 E. about 5-1/2 miles south of Custer. The claim is owned by the Consolidated Feldspar Corp., Trenton, N. J. This is one of many similar locations held by the company; the only work done has been the annual assessment work needed to hold the claim. The deposit is a narrow pegmatite.

At the Albert Lee claim a cut about 6 feet wide has been driven 25 feet. The first 12 feet of the cut, as well as the face, was in schist, which indicates that the pegmatite is 10 or 11 feet thick.

The pegmatite is composed of feldspar, quartz, mica, and tourmaline. The minerals are so badly mixed that the deposit is of doubtful value.

No production is recorded from the property.

Ref: 30, p. 85.

D-35, Ruby Reef Claims, Mica, Custer District, Custer County

The Ruby Reef claims, consisting of the Ruby Reef and the Ruby Reef No. 1, are in the NW1/4 sec. 23, T. 4 S., R. 4 E. about 5 miles south of Custer. First located in 1943 by Louis Stratton and Francis Michaud, the claims are now owned by L. H. Jeffries of Custer.

One pegmatite has been developed on the Ruby Reef No. 1 claim; four others on the Ruby Reef claim have been prospected with small pits. Most of the pegmatites strikes about N. 15° W. and dip steeply southwest. In general the pegmatites are a mixture of quartz, microcline-perthite, and oligoclase, with muscovite mica concentrations near one or both walls. Zoning is poorly defined or absent.

Most of the development has been done on the main pegmatite of the Ruby Reef No. 1 claim. Workings include a narrow opencut about 45 feet long and 20 feet deep, and an inclined shaft 64 feet deep from which levels were driven at depths of 25 feet and 64 feet. Most of the underground work was on the lower level.

Approximately 900 pounds of good-quality sheet mica has been produced from the claims. Most of the remaining pegmatite is, however, rather low grade, and future production is doubtful. The property has been idle since 1944.

D-36, Midas Mine, Mica, Custer District, Custer County

The Midas mica mine is in the SE1/4 sec. 14, T. 4 S., R. 4 E. The property is unpatented and is owned by Jesse Brocha of Custer.

The principal feature of the property is the Midas pegmatite, a strong persistent dike about 570 feet long and 2 to 8 feet wide. Its average width is about 4 feet. Parallel pegmatites west of the Midas pegmatite converge to the south to form a large composite mass. Only the Midas dike contains mica in commercial quantities. Most of the dike material is perthite, albite, and quartz.

Books of muscovite are scattered throughout the entire Midas pegmatite but are more common around the outer edges and in the north 200 feet of the dike. Most of the books are less than 6 inches in diameter. The mica is hard, flat, ruby mica of good grade.

Development includes both surface and underground workings. The surface opening is a pit about 50 feet long, 12 feet wide, and 11 feet deep. Underground workings include drifts and small stopes driven from a 60-foot shaft.

Production totals approximately 10,500 pounds of crude mica from 709 tons of pegmatite. About 350 pounds of sheet was recovered from the crude mica.

Ref: 6, p. 9; 39, pp. 23-26.

D-37, Chipmunk No. 25 Claim (Dilley's Chipmunk), Feldspar, Beryl, Custer District, Custer County

The Chipmunk No. 25 claim, also known as Dilley's Chipmunk, is near the center of sec. 14, T. 4 S., R. 4 E. about 1/2 mile southwest of Sanator, Custer County. The claim is unpatented and is owned by Ben Dilley of Custer.

The principal feature of the claim is a pegmatite dike about 300 feet long and 25 feet wide. Most of the dike material is feldspar, but beryl in commercial quantities can be recovered from several places along the outcrop. Feldspar was shipped from the claim in 1938, but the amount is unknown. Other dike minerals include quartz, muscovite, and tourmaline.

Two small opencuts have been driven to explore the dike. About 1 ton of beryl was shipped from one pit; this represents about 1 percent of the material excavated. Part of the pegmatite on the wall of the second pit averages more than 4 percent beryl.

Production, other than noted above, is not known.

D-38, Maxine Lode, Feldspar, Mica, Custer District, Custer County

The Maxine lode is in secs. 34 and 35, T. 4 S., R. 4 E. near the 1/4 corner between the sections. The claim is unpatented and is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist and granite. Most of the dike material is pink feldspar intermixed with quartz. Mica of good quality is an accessory mineral, together with very small amounts of tourmaline.

Two small cuts have been driven to explore the deposit and to satisfy the requirements of annual assessment labor. A south cut, 7 feet wide and 7 feet high at the face, was driven 12 feet. A second cut, 25 feet north of the first, was 6 feet wide, 15 feet long, and 9 feet deep at the face. Minerals in the second cut are more badly mixed than in the other.

Ref: 30, p. 88.

D-39, Mountain Rose Mine (Mountain Queen), Feldspar, Beryl, Pringle District, Custer County

The Mountain Rose or Mountain Queen mine is in the NE1/4 sec. 14, T. 5 S., R. 4 E. about 3/4 mile north of Pringle, in Custer County. The claim is owned by Mrs. Laura Lofton of Pringle and is known also as the Lofton mine.

The deposit is a pegmatite dike about 150 feet long and 30 feet wide. It consists largely of pink and red feldspar and quartz, with mica, beryl, and tourmaline. Similar pegmatites nearby may be continuations of the same dike.

Development in the principal dike consists of an opencut about 100 feet long, 5 to 20 feet wide, and 6 to 30 feet deep. Smaller cuts have been made in the other two outcrops.

Production from the deposit through 1942 includes 12.5 tons of beryl, at least 540 tons of feldspar, and some 60 tons of scrap mica. Material from the main opencut averaged 0.5 percent beryl, nearly 22 percent feldspar, and about 2.5 percent scrap mica.

Ref: 30, p. 53; 37, p. 76.

D-40, Mack Lode, Feldspar,
Pringle District, Custer County

The Mack lode claim is in the NW1/4 sec. 2, T. 5 S., R. 4 E. about 2-1/2 miles north-northwest of Pringle in Custer County. The claim, owned by the Consolidated Feldspar Corp., Trenton, N. J., in unpatented and undeveloped except for a small opencut.

The deposit is a small pegmatite dike in schist. The dike consists largely of feldspar and quartz with minor amounts of scrap mica and tourmaline. Most of the dike material is intermixed; the feldspar can be recovered only by sorting.

Development consists of a single small opencut, about 6 feet wide, 12 feet long, and 10 feet high at the face.

No production is reported from the property.

Ref: 30, pp. 88-89.

D-41, Lookout Mine, Feldspar, Mica, Beryl,
Pringle District, Custer County

The Lookout mine is in the NE1/4 sec. 10 and the NW1/4 sec. 11, T. 5 S., R. 4 E. about 2 miles northwest of Pringle, in Custer County. The property consists of a single unpatented claim owned by the Carroll Creek Mining Co.

The deposit is an irregular pegmatite in schist. It trends northwest and dips steeply northeast. Most of the material in the pegmatite is deep pink feldspar. A small amount of quartz and mica are present. Accessory minerals include beryl and columbite.

Development is by a single opencut about 8 feet wide that follows the pegmatite for 20 feet. The cut ranges in depth from 6 feet to 20 feet.

Approximately half of the material broken in the opencut was feldspar, which was sorted and shipped to Custer. Other minerals produced were 700 pounds of beryl and about 5 pounds of columbite.

Ref: 30, p. 42.

D-42, Carroll Claims, Feldspar,
Pringle District, Custer County

The Carroll claims are in secs. 3 and 10, T. 5 S., R. 4 E. about 2-3/4 miles northwest of Pringle, in Custer County. The group is made up of three unpatented claims, the Rosebud, the Park, and the Lookout. The Lookout claim has been described under the Lookout mine; the following remarks, therefore, apply only to the two remaining claims.

The claims are owned by Glenn Carroll of Pringle; Don Carroll of Grand Island, Nebr.; and William Moberly of Omaha, Nebr. This group probably is composed of the same men that control the Carroll Creek Mining Co., reported to own the Lookout mine.

Of the two claims, only the Park claim has been prospected. Here a few small pits have been cut in an irregular pegmatite. These cuts expose pinkish feldspar, with quartz, scrap mica, and a few crystals of beryl.

No production has been reported from the two claims.

D-43, Mountain Beryl Claim, Feldspar, Beryl, Pringle District, Custer County

The Mountain Beryl claim is in the NW1/4 sec. 11, T. 5 S., R. 4 E. about 2 miles northwest of Pringle, Custer County. The claim, which is unpatented, is owned by S. T. Gamber of Custer.

Two pegmatite dikes make up the deposit. The dikes are roughly in line and strike about N. 20° W. One dike is about 10 feet thick and 400 feet long; the other is 40 feet wide and 460 feet long. Both pegmatites are composed of pink feldspar and quartz, with subordinate amounts of muscovite, biotite, tourmaline, and beryl. The muscovite is concentrated locally along the contacts. Columbite and lithiophilite have been identified in the pegmatite, and beryl crystals from 3/16 inches to 6 inches in diameter are fairly abundant. Beryl crystals as large as 18 inches by 4 feet have been reported.

Development at the property consists of five shallow prospect pits. Production is not known exactly; about 3 tons of beryl and 10 tons of specimen beryl are listed, as well as 2-1/2 tons of scrap mica and an unknown amount of feldspar.

Ref: 37, p. 76.

D-44, Bonnie Lode, Mica, Pringle District, Custer County

The Bonnie lode, a mica prospect, is in the NW1/4 sec. 11, T. 5 S., R. 4 E. about 1-3/4 miles northwest of Pringle, Custer County. The claim was located by F. J. Walsh and D. W. Hunter in 1943.

The deposit is a long, narrow pegmatite that extends into the Mountain Beryl claim on the north. It strikes north and dips steeply westward and where explored is about 4 feet wide. The only commercial mineral in the pegmatite on the Bonnie claim is mica, but on the Mountain Beryl claim some beryl has been produced.

Recoverable mica is as much as 2 percent of the dike, but most of the mica is tied and wavy, hence recovery of sheet is low. Most of the mica is white to pale ruby and is only moderately air stained.

Development consists of a 12-foot shaft near the south end of the dike. No production is reported from the property, which has been idle since 1943.

D-45, Payday Lode, Feldspar, Mica, Beryl, Pringle District, Custer County

The Payday lode is in the SE1/4 sec. 11, T. 5 S., R. 4 E. about 1-1/2 miles northwest of Pringle. The property consists of one unpatented claim and is owned by L. D. Pitts of Pringle.

The deposit is a tabular pegmatite about 300 feet long and from 10 to 20 feet thick. It strikes northwest and dips steeply northeast.

Beryl is distributed unevenly throughout the dike, but most of it is in the core. This core, composed of quartz, albite, tourmaline, and mica, contains about 18 percent beryl. The crystals are small; the average size is 1-1/2 inches.

Dike material outside the core is largely soda-feldspar and perthite. A mica-rich zone 2 feet wide extends for 160 feet along the footwall. Although mica totals as much as 5 or 6 percent of the mica zone, it is clear white mica suitable only for scrap. Books average about 2 inches in diameter, and "A" structure is common. A similar mica zone on the hanging wall contains about 3 percent scrap mica.

Development consists of five shallow pits; three of these were driven to explore the mica zones.

Feldspar, mica, and beryl have been produced from the deposit. Exact figures are not available, but it is reported that 3 tons of beryl was produced in 1927.

Ref: 37, p. 77.

D-46, Pringle Mine, Feldspar, Beryl, Pringle District, Custer County

The Pringle mine is in the NE1/4 sec. 13, T. 5 S., R. 4 E. about 3/4 mile northeast of the town of Pringle, Custer County. The property is owned by Charles Pringle.

The deposit is a large pegmatite dike in schist. It strikes north and dips vertically. Feldspar is the principal mineral in the dike, but some beryl is recovered as well. Other accessory minerals include rose quartz, muscovite, and columbite-tantalite.

Mine development is limited to a single opencut about 75 feet long, 60 feet wide, and 6 or 8 feet deep. Equipment for small scale mining is adequate, and the property is a small but steady producer. Production normally is 6 to 10 tons of feldspar a day. Between 1940 and 1943 the mine produced 5 tons of beryl. Inasmuch as the dike contains about 0.25 percent beryl, a small but steady production of this mineral is assured.

D-47, Phenacite Prospect, Feldspar, Beryl, Pringle District, Custer County

The Phenacite prospect is in the SE1/4 sec. 1, T. 5 S., R. 4 E. about 2 miles north of Pringle, Custer County. The property is unpatented and is owned by Samuel A. Kirk.

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The deposit is a long, wedge-shaped pegmatite dike. Its course can be traced for 1,150 feet, and it ranges in width from 25 feet at the ends to about 75 feet near the middle. The dike stands as much as 20 feet above ground; it strikes north and dips about 30° west.

Exploration has not been sufficient to determine the composition and value of the pegmatite. In a single small cut, 10 feet long, 8 feet wide, and 6 feet deep, the dike is fine grained to coarse and shows numerous small beryl crystals, most of which are less than 1 inch in diameter. Mica, probably suitable only for scrap, also is present but in undetermined amounts. The same dike on the Henwood property, which adjoins the Phenacite on the north, has produced both feldspar and beryl.

D-48, Henwood Lode, Feldspar, Beryl, Pringle District, Custer County

The Henwood lode claim is in the NE1/4 sec. 1, T. 5 S., R. 4 E. about 3 miles north of Pringle. The claim is patented and is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike that strikes north and dips vertically. It ranges in width from 25 to 50 feet. Most of the dike material is potash feldspar, which is iron stained but of good quality. Accessory minerals include quartz, mica, and beryl.

Development is by a single opencut. This cut was driven about 6 feet wide for 25 feet, then enlarged to 12 feet wide and driven 12 or 15 feet farther. A loading bin, about 25 feet from the mouth of the cut, provides storage for sorted feldspar.

Total production is not known. At least 100 tons was shipped before 1938. A small amount of beryl may have been shipped as well, but figures are not available.

Ref: 30, p. 85.

D-49, White Elephant Mine, Feldspar, Pringle District, Custer County

The White Elephant mine is in the SE1/4 sec. 36, T. 4 S., R. 4 E. about 8 miles south of Custer. The mine is owned and operated by the Abingdon Sanitary Manufacturing Co., Abingdon, Ill.

The deposit is an elliptical mass of pegmatite. Mining is confined to a feldspar body inside the mass of pegmatite. This body of feldspar, from 30 to 80 feet wide, contains subordinate amounts of quartz, mica, and beryl, which are sorted during mining. The feldspar is blocky and of good quality.

Production averages about 500 tons of feldspar a month. The sorted feldspar is trucked to a rail siding north of Pringle and shipped by rail to Illinois. Total shipments from the property are between 60,000 and 75,000 tons of feldspar. At least 2-1/2 tons of beryl has been sold locally.

The main mine opening is an open pit 60 to 90 feet deep, 30 to 80 feet wide, and several hundred feet long. Benches about 10 feet high are carried across the advancing face of the pit. The benches are drilled and blasted at irregular intervals.

Ref: 30, p. 69; 37, p. 83.

D-50, Soda Spar Mine, Feldspar, Beryl, Mica,
Custer District, Custer County

The Soda Spar mine is in the NW1/4 sec. 25, T. 4 S., R. 4 E. about 5 miles north of Pringle, Custer County. The property should not be confused with two others with the same name located north of Custer. This claim is owned by L. D. Pitts of Custer.

The deposit is a vertical pegmatite dike in schist. It ranges from 6 to 40 feet in width and is exposed for about 500 feet along the surface. The dike is composed largely of feldspar and quartz. Narrow zones along the wall have been locally enriched with mica, but mica is scattered as well in the interior of the dike. A small amount of beryl is present in crystals up to 8 inches in diameter.

Development is by two small cuts, one near each end of the dike. The north cut, about 10 feet deep, was driven about 25 feet, and ranges in width from 5 to 15 feet. The south cut is 15 feet long, 5 feet wide, and 10 feet deep.

Recorded production includes 20 tons of feldspar in 1934, a small amount of beryl, and 2 carloads of crude and scrap mica.

Ref: 30, p. 53; 37, p. 80.

D-51, Seller's Mine, Feldspar,
Custer District, Custer County

Seller's mine is north of the center of sec. 25, T. 4 S., R. 4 E. about 8-1/2 miles south of Custer. The property is owned by Mrs. C. Seller.

The deposit is an elongated pegmatite about 300 feet long and 50 feet wide. Most of the material in the pegmatite is potash feldspar. The usual accessory minerals, such as quartz, mica, and tourmaline are either absent or present only in small amounts. As much as three-quarters of the material broken can be shipped as feldspar.

Two cuts have been made in the deposit. The principal cut was opened in 1938. Material in the cut was sorted after being broken and trammed to a 25-ton loading bin for shipment to Custer.

Total production is not recorded, but some feldspar has been shipped.

Ref: 30, pp. 52-53.

D-52, Big Bull Lode, Feldspar,
Custer District, Custer County

The Big Bull lode is in the SE1/4 sec. 25, T. 4 S., R. 4 E. about 7 miles south of Custer on the old Sidney trail. The property is owned by S. T. Gamber of Custer but was last operated under lease by Fred Wheeler and W. W. Jolley of Custer. The deposit is a large pegmatite "blow-up", composed largely of iron-stained potash feldspar. Accessory minerals include ribbon quartz and tourmaline.

Development is by an opencut 15 feet wide, 25 feet long, and 25 feet high at the face. Material broken in the cut was sorted and trammed to a 10-ton bin from which it was shipped to Custer.

The recorded production is about 25 tons of feldspar.

Ref: 30, pp. 54-55.

D-53, Evergreen Group, Feldspar, Beryl, Custer District, Custer County

The Evergreen group of 3 unpatented claims is near the center of sec. 1, T. 4 S., R. 4 E. about 2 miles south of Custer. The claims are owned by B. M. Dilley of Custer and are unpatented.

The claims are along north-trending pegmatite dikes composed largely of microcline and quartz. Beryl is present in subordinate amounts; at least 1 ton of beryl has been shipped from a pit on the Evergreen No. 1 claim.

Two of the claims have been explored with opencuts. The principal opening, a medium-size pit, is on the Evergreen No. 1 claim. About 1,800 feet south on one of the other claims is a second pit, which is smaller.

Production records have not been kept. Some feldspar has been shipped from the property, probably from the opencut on the Evergreen No. 1. This pit, as noted above, also produced at least 1 ton of beryl.

D-54, Phillip Mine, Feldspar, Custer District, Custer County

The Phillip mine is in the NW1/4 sec. 19, T. 4 S., R. 4 E. about 6 miles south of Custer. The mine was owned in 1938 by the F. E. Schundler Feldspar Co., but it is not known if this property was sold to the Consolidated Feldspar Corp., which acquired most of the Schundler mines shortly after that date.

The deposit is a northeast-striking pegmatite in schist. It is about 200 feet long and 50 feet wide; the dip is vertical. About 15 feet of material in the pegmatite contains enough good quality feldspar to mine. The feldspar is mixed with quartz. A small amount of mica also is found in the dike, together with tourmaline, which is more abundant toward the walls of the pegmatite.

Development consists of an opencut with two benches. The main cut is about 75 feet long, 15 feet wide, and 10 feet deep. The upper bench, also 15 feet wide, is about 15 feet deep.

About half of the material broken in the cut was marketable feldspar. In 1938 three men were mining and sorting 200 tons of feldspar a month.

Production by 1938 totaled 2,000 tons.

Ref: 30, p. 40.

D-55, Roxy Lode, Feldspar,
Custer District, Custer County

The Roxy lode is in the SE1/4 sec. 18, T. 4 S., R. 5 E. about 6 miles south-southeast of Custer. The property, which is only a prospect, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist and quartzite. It consists of feldspar, with quartz, mica, and tourmaline. Most of the material is intermixed, and clean feldspar can be had only by sorting.

Development is by a single small opencut driven to conform to the requirement of annual labor as the claim is not patented. The cut is 6 feet wide, 8 feet long, and 9 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 84.

D-56, Dike No. 2 Mine, Feldspar, Spodumene,
Custer District, Custer County

The Dike No. 2 mine is in the NW1/4 sec. 18, T. 4 S., R. 5 E. about 5 miles south of Custer. The property, which is owned by Amos Burnside, Lewis Collingwood, and Martin O'Brien, all of Custer, is about 500 feet south of the Black Diamond mine.

The deposit, a large mass of pegmatite about 250 feet long and 120 feet wide, occupies the top of a small knoll. Most of the material in the pegmatite is feldspar and quartz. Accessory minerals include spodumene and mica. The mica is suitable only for scrap.

Development consists of 4 opencuts, which range in length from 45 to 100 feet, and a small shaft 20 feet deep. The cuts all are about 12 to 15 feet wide; the deepest is about 20 feet.

No production is reported from the property, which has been idle since the early 1940's.

D-57, Black Diamond Mine, Spodumene, Mica,
Custer District, Custer County

The Black Diamond mine is in the NW1/4 sec. 18, T. 4 S., R. 5 E. about 5-1/2 miles south-southeast of Custer. The property, which consists of one unpatented claim, was located in 1922. It is owned by the Sutherland and the Bond families of Custer.

The deposit is a large, poorly defined pegmatite that lies along the south and west slope of a 150-foot ridge. It trends north, and ranges in width from about 14 feet near the north end to 240 feet on the south end. The length is about 650 feet.

The pegmatite contains numerous inclusions and stringers of schist but is made up largely of coarse-grained potash feldspar with subordinate amounts of muscovite mica.

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Spodumene is the principal economic mineral at the Black Diamond mine. Several tabular bodies of spodumene, from 1 foot to 4 feet thick, have been exposed in opencuts and a small drift. One cut is 80 feet long, 15 to 40 feet wide, and 20 feet deep. Another is about 50 feet long, 10 to 25 feet wide, and 14 feet deep. The drift is about 20 feet long.

No production is reported from the property.

D-58, Beecher Lode, Lithium, Beryl, Mica, Custer District, Custer County

The Beecher lode is in the NW1/4 sec. 18, T. 4 S., R.5 E. about 5 miles southeast of Custer. The property lies just south of the Beecher No. 2, or Longview, mine and north of the Black Diamond mine. The claim is patented.

Work at the Beecher mine began in 1900 and has been carried on sporadically since that time.

The deposit is a pegmatite lens about 900 feet long and 80 feet wide. It strikes north and dips to the west. Mineralogically the pegmatite is complex. It contains quartz, albite, muscovite, perthite, spodumene, tourmaline, apatite, cassiterite, beryl, amblygonite, columbite-tantalite, lepidolite, and cleavelandite.

Development includes 3 large opencuts, 2 vertical shafts 60 feet and 25 feet deep, 2 short inclined shafts, 7 adits, 27 trenches, and 6 diamond-drill holes.

Production figures are not complete, but between 1909 and 1944 about 25,000 tons of pegmatite produced 1,970 tons of amblygonite, 100 tons of beryl, 50 tons of spodumene, 500 tons of scrap mica, 17 pounds of sheet mica, 25 tons of columbite, and 33 tons of tantalite.

Ref: 12, p. 256; 27, p. 3; 30, p. 67.

D-59, Longview (Beecher No. 2) Mine, Spodumene, Custer District, Custer County

The Longview mine, known also as the Beecher No. 2, is in the NW1/4 sec. 18 and the SW1/4 sec. 7, T. 4 S., R. 5 E. about 5 miles south-southeast of Custer. The property lies just west of the Beecher mine and extends west into sec. 13, T. 4 S., R. 4 E.

The deposit is an elongated mass of pegmatite about 1,150 feet long and 200 feet wide. The pegmatite extends into patented ground of the Beecher mine on the east, but the remainder is covered by two overlying claims, the Longview and the Beecher No. 2. Ownership of the overlap is in dispute, tut both claims are optioned to the Lithium Corporation of America.

Four types of pegmatites are present in the Longview-Beecher No. 2 claims. In three of these, spodumene-bearing material makes up the core of the pegmatite; spodumene is present in the other pegmatite only as small isolated masses.

In the three principal spodumene-bearing masses the accessory minerals are quartz, albite, and muscovite. Most of the spodumene is found as small crystals; occasional logs as large as 18 inches by 6 feet are found. The area of spodumene-bearing pegmatite is about 78,000 square feet, the equivalent of 6,200 tons per foot of depth. Spodumene content ranges from 10 to 15 percent.

Development includes a 170-foot adit from which an 80-foot crosscut has been driven to a glory-hole about 20 feet deep, several small shafts, and numerous trenches and prospect pits.

Ref: 27, pp. 1-14.

D-60, Bare Top No. 1 Lode, Feldspar,
Custer District, Custer County

The Bare Top No. 1 lode is in the NW1/4 sec. 5, T. 4 S., R. 5 E. about 3 miles southeast of Custer. The claim, which is owned by the Consolidated Feldspar Corp., Trenton, N. J., extends into sec. 31, T. 3 S., R 5 E. on the north. The claim is unpatented.

Little is known of the deposit, a narrow pegmatite dike in quartzite. Most of the dike material is feldspar, which is badly mixed with quartz, mica, and tourmaline.

Development consists of a single small prospect pit about 10 feet wide. This pit has been driven 10 feet and is 12 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 79.

D-61, Sno Lode, Feldspar,
Custer District, Custer County

The Sno lode is near the north side of the N1/2 sec. 5, T. 4 S., R. 5 E. about 3 miles southeast of Custer, S. Dak. The property consists of one unpatented claim and is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist and quartzite. Most of the dike material is feldspar, which is intermixed with quartz, mica, and tourmaline.

Development consists of a shaft, 8 feet by 8 feet in section and 4 feet deep, and 2 opencuts. One cut, about 400 feet from the shaft, is 10 feet wide, 6 feet long, and 10 feet high at the face. The other cut is 6 feet wide, 15 feet long, and 10 feet high at the face. In the first cut the upper half of the face is in schist.

No production has been reported from the property.

Ref: 30, pp. 79-80.

D-62, Sno No. 2 Lode, Feldspar,
Custer District, Custer County

The Sno No. 2 lode is in sec. 32, T. 3 S., and sec. 5, T. 4 S., R. 5 E. about 3 miles southeast of Custer, S. Dak. The property, which is unpatented, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in quartzite. Most of the dike material is feldspar, which in places is badly intermixed with quartz, mica, and tourmaline.

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Development consists of three small opencuts. Two of these are recent; the third cut was driven years ago in search for mica. Both of the recent cuts are about 10 feet long; 1 is 6 feet wide and 10 feet deep at the face, the other is 10 feet wide and 5 feet deep at the face. The narrower cut disclosed cleaner feldspar than the other.

No production is reported from the property, which is idle today.

Ref: 30, p. 80.

D-63, Sno No. 1 Lode, Feldspar,
Custer District, Custer County

The Sno No. 1 lode is in the NE1/4 sec. 5, T. 4 S., R. 5 E. about 3 miles southeast of Custer, S. Dak. The property consists of one unpatented claim, and is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It is composed largely of white feldspar, which is mixed with quartz, mica, and tourmaline.

Development consists of four small open cuts. The main cut is 8 feet wide, 12 feet long, and 5 feet deep at the face. Two small cuts have been driven nearby; one is in feldspar, the other in quartz. About 300 feet northwest of the main cut is another opening about 5 feet wide, 10 feet long, and 10 feet deep. The feldspar in this last cut is unusually white.

No production has been reported from the property.

Ref: 30, p. 80.

D-64, High Lode, Feldspar,
Custer District, Custer County

The High lode is in the NE1/4 sec. 5, T. 4 S., R. 5 E. about 3-1/4 miles southeast of Custer, S. Dak. The property, which is unpatented, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a large pegmatite dike in schist. Most of the dike material is feldspar intermixed with quartz, mica, and tourmaline.

Development consists of two opencuts driven toward each other from opposite sides of the dike. One cut, 20 feet long, is 8 feet wide and 6 feet deep at the face. The other cut is 15 feet long and is 7 feet wide and 8 feet deep at the face. The faces of the 2 cuts are 25 feet apart, which indicates that the dike may be as much as 60 feet thick.

No production is reported from the property.

Ref: 30, p. 78.

D-65, Top Lode, Feldspar,
Custer District, Custer County

The Top lode, owned by the Consolidated Feldspar Corp., Trenton, N. J., is in the NE1/4 sec. 5, T. 4 S., R. 5 E. about 3-1/2 miles southeast of Custer, S. Dak. The property is unpatented.

The deposit is a narrow pegmatite dike in schist. It contains feldspar intermixed with quartz, mica, and tourmaline.

Development is by a single small opencut driven to conform to the requirement for annual labor. The cut, which is 12 feet long, is 8 feet wide and 10 feet deep at the face.

No production is reported from the property, which is idle today.

Ref: 30, p. 78.

D-66, South Lode, Feldspar,
Custer District, Custer County

The South lode is one of a number of unpatented claims in the area southeast of Custer, S. Dak., that are owned by the Consolidated Feldspar Corp., Trenton, N. J. The South claim probably is in the SW1/4 sec. 5, T. 4 S., R. 5 E. about 3-1/2 miles southeast of Custer.

The deposit is a pegmatite dike in schist and strikes north. Most of the dike material is feldspar, which is mixed with quartz, mica, and tourmaline.

Development is by a single shallow opencut. This cut, about 8 feet wide, has been driven 18 feet, and is 2-1/2 feet deep at the face.

No production is reported from the property, which is idle today.

Ref: 30, pp. 77-78.

D-67, Star Lode, Feldspar
Custer District, Custer County

The Star lode probably is in the SE1/4 sec. 5,T. 4 S., R. 5 E. near the center of the section. The claim, which is unpatented, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist and quartzite. It contains feldspar intermixed with quartz, mica, and tourmaline. Most of the material is so mixed that clean feldspar can be had only by sorting.

Development consists of three small opencuts. One of these is 8 feet wide, 15 feet long, and 10 feet deep at the face. Another, 400 feet west of the first cut, is 8 feet wide, 10 feet long, and 6 feet deep at the face. The third cut is smaller.

No production has been reported from the property.

Ref: 30, p. 79.

D-68, East Lode, Feldspar,
Custer District, Custer County

The East lode is in the SE1/4 sec. 5, T. 4 S., R. 5 E. about 3-3/4 miles southeast of Custer, S. Dak. The property, an unpatented lode claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It consists largely of feldspar, which is intermixed with quartz, mica, and tourmaline.

Development consists of a main opencut about 6 feet wide, 15 feet long, and 8 feet deep at the face. Three similar cuts were made at points 25 feet and 500 feet north of the main cut and 25 feet south of the main cut.

No production is reported from the property, which is idle today.

Ref: 30, p. 78.

D-69, West Lode, Feldspar, Custer District, Custer County

The West lode is in the SE1/4 sec. 5, T. 4 S., R. 5 E., 3-3/4 miles southeast of Custer, S. Dak. The property, owned by the Consolidated Feldspar Corp., Trenton, N. J., is unpatented.

The deposit is a pegmatite dike in schist, and consists of mixed feldspar, quartz, mica, and tourmaline.

Development consists of two opencuts driven toward each other from opposite sides of the dike. One cut, 6 feet wide and 15 feet long, is still in schist at the end where the face is 12 feet high. The other cut is in pegmatite, and is about the same size but only 7 feet deep. About 30 feet of material separates the faces of the 2 cuts.

No production is reported from the property, which is idle today.

Ref: 30, pp. 78-79.

D-70, St. Louis Mine (E. L. Davis Mine), Feldspar, Mica, Custer District, Custer County

The old St. Louis mine, known today as the E. L. Davis mine, is in the NW1/4 sec. 3, T. 4 S., R. 5 E. about 4-1/2 miles southeast of Custer, S. Dak.

The deposit, a large irregular blow-up of pegmatite, has been sporadically worked for many years. Most of the early work was directed toward recovering mica; in recent years feldspar has been the principal mineral produced. The mass of pegmatite is about 500 feet in diameter. It contains, in addition to feldspar and mica, both quartz and tourmaline.

Little is known of the early operations. An old shaft, reported to be 90 feet deep, is full of water. Recent production of feldspar has come from two opencuts. One cut is about 50 feet long, 50 feet wide, and 35 feet deep at the face. The second cut, about 50 feet from the first, is about half as large. Both cuts were in operation late in 1938, and about 10 tons of sorted feldspar was being produced each day.

Ref: 30, p. 62; 37, p. 81; 62, p. 395.

D-71, Number Nine Lode, Feldspar, Mica, Beryl, Custer District, Custer County

The Number Nine lode is near the center of sec. 9, T. 4 S., R. 5 E. about 5 miles southeast of Custer, S. Dak. The property is an unpatented claim and is owned by Lewis Collingwood of Custer.

The deposit is a pegmatite dike in schist about 450 feet long and 20 feet wide. It strikes north and dips steeply east. Most of the dike material is potash feldspar; accessory minerals include a little mica, beryl, and spodumene.

Development is by two opencuts. One of these, some 275 feet from the south end of the dike, is 15 feet wide, 37 feet long, and 35 feet deep at the face. The second cut, known as the lower pit is near the other end of the dike. This pit is 16 feet wide, 30 feet long, and about 10 feet deep.

In 1938 the deposit was being mined intermittently by three men. Total production is not known, but at least 400 tons of feldspar has been shipped, as well as 4 tons of beryl.

Ref: 30, pp. 48-49.

D-72, Mitchell Lode, Feldspar, Custer District, Custer County

The Mitchell lode is in sec. 9, T. 4 S., R. 5 E., about 1/4 mile west of Scott's Rose Quartz mine and about 5 miles southeast of Custer, S. Dak. The property, which is unpatented, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist and quartzite. It contains feldspar, quartz, mica, and a little tourmaline.

Development is by a single small opencut driven from assessment work. This cut, 8 feet wide and 18 feet long, is 10 feet deep at the face.

No production is reported from the property, which is idle today.

Ref: 30, pp. 80-81.

D-73, Harry Lode, Feldspar, Custer District, Custer County

The Harry lode is in the S-1/2 sec. 9, T. 4 S., R. 5 E. about 5 miles southeast of Custer, S. Dak. The property, a single, unpatented claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in quartzite. Most of the dike material is feldspar, intermixed with quartz, mica, and tourmaline.

With the exception of assessment work, the deposit is undeveloped. A single small cut about 8 feet wide has been driven 8 feet. The cut is 10 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 81.

D-74, Scott's Rose Quartz Mine, Quartz, Mica, Feldspar, Custer District, Custer County

The Scott quartz mine is west of the center of sec. 10, T. 4 S., R. 5 E. about 7 miles southeast of Custer, S. Dak. The property is an unpatented lode claim of about 20 acres and is owned by Frank Scott of Custer.

The deposit is an irregular pegmatite in slate and schist. Contained in the pegmatite is a large mass of rose quartz that ranges in thickness from 6 to 40 feet. This quartz mass is several hundred feet long, and has been exposed through a vertical distance of 30 feet. Accessory minerals in the pegmatite include feldspar, mica, beryl, spodumene, amblygonite, and tourmaline.

Development includes 3 opencuts, the largest of which is about 50 feet wide, 75 feet long, and 20 feet deep. The other pits are about 20 feet wide and 40 feet long.

Total production of rose quartz is over $40,000. Some feldspar has been shipped, as have small amounts of beryl, mica, spodumene, and specimen tourmaline.

Ref: 37, p. 80.

D-75, Haselrodt Lode, Feldspar, Custer District, Custer County

The Haselrodt lode is in the SE1/4 sec. 10, T. 4 S., R. 5 E. about 7-1/2 miles southeast of Custer, S. Dak. The property is unpatented and is owned by Lewis Collingwood, Charles Roland, and G. W. Coats, all of Custer.

The deposit is an irregular pegmatite dike that strikes east. Most of the dike material is good quality feldspar. Accessory minerals include quartz, considerable tourmaline, and a small amount of mica.

Several small cuts have been made in the east end of the dike. These expose considerable good feldspar, but none of this has been shipped.

Ref: 30, p. 49.

D-76, Red Rose No. 1 Lode, Pegmatite, Custer District, Custer County

The Red Rose No. 1 lode is in the N1/2 sec. 10, T. 4 S., R. 5 E. about 7 miles southeast of Custer, S. Dak. The property is about 1/2 mile northeast of the Scott rose quartz mine and is owned by F. S. Scott of Custer. It is unpatented.

The deposit is a pegmatite dike that strikes north. Little is known of the size of the dike, which was first prospected in 1938. A small cut near the south end of the deposit probably is the only work done to date.

No production has been reported from the deposit.

Ref: 30, p. 49.

D-77, Little Spar Lode, Feldspar,
Custer District, Custer County

The Little Spar lode is about 7-1/2 miles southeast of Custer, S. Dak., in the N1/2 sec. 15, T. 4 S., R. 5 E. The claim, which is unpatented, is owned by Dave Virtue of Custer. The claim adjoins the Rives lode claim on the north.

The deposit is a pegmatite dike in granite. It contains feldspar, quartz, mica, and tourmaline. Most of the minerals are somewhat blocky but mixed; the tourmaline is in relatively large crystals.

Development is by an L-shaped cut, which was driven about 10 feet west to enter the dike, then driven south about 20 feet. This cut is about 5 feet wide and is 6 feet deep at the face.

About 20 tons of feldspar had been shipped in September 1938.

Ref: 30, p. 64.

D-78, Virginia Dike, Pegmatite,
Custer District, Custer County

The Virginia dike is in the NE1/4 sec. 15, T. 4 S., R. 5 E. about 1/4 mile northeast of the Rives lode and about 7-1/2 miles southeast of Custer. The claim, which is owned by F. H. Keith, probably extends east into the NW1/4 sec. 14.

The deposit is a prominent knob of pegmatite in schist and quartzite. Little is known of the composition of the pegmatite, but feldspar probably is the most common mineral.

Late in 1938 about 2 feet of overburden was stripped with a bulldozer from an area 50 feet by 150 feet in preparation for mining. At that time no excavation had been made in the pegmatite.

No production has been reported from the property.

Ref: 30, p. 54.

D-79, Triangle A Lode, Feldspar,
Custer District, Custer County

The Triangle A lode is in the NE1/4 sec. 15, T. 4 S., R. 5 E. about 7 miles southeast of Custer, S. Dak. Ownership of the claim is unknown; in 1938 the property was being developed by Lewis Collingwood of Custer.

The deposit is a prominent pegmatite dike that is exposed for about 1,000 feet along the strike. Its borders are irregular, and the dip is uncertain.

Most of the dike material is feldspar of good quality except for intergrown quartz. Some tourmaline also is present.

At least 3,000 tons of feldspar has been broken in the dike, but none of this broken rock has been shipped.

Ref: 30, p. 48.

D-80, Rives Lode, Feldspar, Mica,
Custer District, Custer County

The Rives lode is in the NE1/4 sec. 15, T. 4 S., R. 5 E. about 7 miles southeast of Custer, S. Dak. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J., and is unpatented.

The deposit is a small pegmatite mass in schist and granite. Some of the dike material is good-quality feldspar. Associated minerals include quartz, mica, and tourmaline. The feldspar is clean and free from quartz; most of the mica is found with the tourmaline. Relatively large sheet mica is found in seams.

Development is by an opencut about 16 feet wide, 55 feet long, and 25 feet deep at the face.

Total production is not known. About 25 tons of feldspar was shipped from the claim in July and August 1938, and 100 pounds of sheet mica was sorted and sold.

Ref: 30, pp. 81-82.

D-81, Red Deer Mine, Mica,
Custer District, Custer County

The Red Deer mica mine, owned by the Consolidated Feldspar Corp., Trenton, N. J., is in the SE1/4 sec. 15 and the NE1/4 sec. 22, T. 4 S., R. 5 E. about 8 miles southeast of Custer, S. Dak.

The deposit is a very irregular, gently dipping pegmatite in schist and quartzite. It ranges from 10 to 17 feet in thickness, and is distinctly zoned. Along the contact with the enclosing schist and quartzite the pegmatite is composed of quartz, albite, microcline, and muscovite. The core is quartz and microcline.

The wall zone ranges from 2 to 7 feet in thickness. On the hanging wall the average thickness of the zone is 5 feet; along the footwall the thickness is 3 feet. The core of the pegmatite is from 3 to 8 feet thick. Mica has been produced from both the hanging wall and footwall zones.

Mica from the Red Deer mine is mostly hard, flat, ruby mica in books as large as 12 inches in diameter. Most of the mica is air stained.

Development includes both surface and underground workings. The main surface excavation is an opencut that has an area of 2,600 square feet. Underground openings include five drifts driven from an inclined shaft.

Total production is over 100,000 pounds of mica from 2,350 tons of pegmatite. About 4 percent of the mica was sheet mica.

Ref: 30, p. 82.

D-82, Spud Lode, Feldspar, Custer District, Custer County

The Spud lode is in the SW1/4 sec. 21, T. 4 S., R. 5 E. about 6 miles southeast of Custer, S. Dak. The claim is unpatented, and is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It contains feldspar, quartz, mica, and tourmaline. Most of the feldspar is blocky, but is so mixed with the quartz and tourmaline that clean feldspar can be had only by sorting.

Development is by a single opencut, which is about 10 feet long, 10 feet wide, and 10 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 83.

D-83, Pot Lode, Feldspar, Custer District, Custer County

The Pot lode is in the SW1/4SW1/4 sec. 21, T. 4 S., R. 5 E. about 10 miles by road southeast of Custer, S. Dak. The property is owned by Scovel Johnson of Custer and is unpatented.

The deposit is a pegmatite dike in quartzite. Most of the dike material is blocky feldspar and quartz; accessory minerals include mica and tourmaline. The feldspar is dark.

Development is by a small opencut about 5 feet wide and 18 feet long. This cut is 20 feet deep at the face.

About 10 or 15 tons of feldspar has been shipped from the property.

Ref: 30, p. 64.

D-84, Tut Lode, Feldspar, Custer District, Custer County

The Tut lode is in the NW1/4 sec. 29, T. 4 S., R. 5 E. about 8 miles southeast of Custer, S. Dak. The property is owned by Scovel Johnson of Custer and is unpatented.

The deposit is a pegmatite dike in quartzite. Pegmatite minerals include blocky feldspar, pink quartz, mica, and tourmaline. Clean feldspar can be had by sorting.

Development is by two opencuts. The main cut is 6 feet wide, 60 feet long, and 25 feet deep at the face. A second cut, 75 feet south of the main cut, is 6 feet wide, 20 feet long, and 15 feet deep at the face.

Total production is not known but undoubtedly is small. About 20 tons of feldspar was shipped from the main cut.

Ref: 30, p. 64.

D-85, Bellmare No. 1 and No. 4 and Wildwood Claims, Feldspar, Mica, Custer District, Custer County

The Bellmare and the Wildwood claims, owned by G. M. Parker of Custer, S. Dak., are in the NE1/4 sec. 22, T. 4 S., R. 5 E. about 7 miles southeast of Custer. The group consists of eight unpatented claims.

A number of pegmatites crop out on the group of claims, but few of them have been developed. In general these pegmatites range from a few feet to as much as 30 feet in width. Most of them are composed of potash feldspar and quartz; the feldspar is unusually pure and free from other minerals. Mica, in books up to 6 inches in diameter, is found in several of the pegmatites. In general this mica is hard, flat, ruby mica, but most of it is air stained.

Development is by several small cuts and shallow trenches. A cut on the Wildwood No. 1 claim is 25 feet long, 25 feet wide, and 10 feet deep at the face. About 60 tons of high-grade feldspar was shipped from this cut.

D-86, Lost Spring Lode, Feldspar, Custer District, Custer County

The Lost Spring lode is in the SW1/4 sec. 22, T. 4 S., R. 5 E. about 7-1/2 miles southeast of Custer, S. Dak. The property consists of a single unpatented claim, which is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist and quartzite. Most of the dike material is mixed feldspar, quartz, mica, and tourmaline.

Development is by a single small opencut. This cut is 8 feet wide, 7 feet long, and 8 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 83.

D-87, Antler Mine, Mica, Custer District, Custer County

The Antler mine is in the NW1/4 sec. 27, T. 4 S., R. 5 E. about 8 miles southeast of Custer, S. Dak. The property is owned by Louis Graham of Custer.

No information is available in regard to the size of the deposit, which is a pegmatite in schist. It contains plagioclase, quartz, muscovite, perthite, and tourmaline. Mica is the principal mineral produced; in places the mica amounts to 20 percent of the pegmatite. Some of the books are as long as 15 inches, but most of the mica is inferior in grade because of ruling, staining, and waviness. The mica is rather soft. About a 2-inch by 2-inch sheet is as large as has been recovered.

Development is by several irregular opencuts and a 25-foot drift.

Total production is not known. In 1943 the deposit produced 532 pounds of trimmed sheet mica and 695 pounds of untrimmed punch.

D-88, Flynn Lode, Feldspar,
Custer District, Custer County

The Flynn lode is in the N1/2 sec. 27, T. 4 S., R. 5 E. about 8 miles southeast of Custer, S. Dak. The property, an unpatented claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. Most of the dike material is feldspar, mixed with quartz, mica, and tourmaline.

Development consists of two small opencuts. One of these is 7 feet wide, 15 feet long, and 8 feet deep at the face. The bottom of the cut was in schist for 18 inches above the floor. A second cut, 25 feet west of the first cut, is 5 feet wide, 10 feet long, and 6 feet deep at the face.

No production has been reported from the property.

Ref: 30, p. 84.

D-89, Helen Group, Feldspar,
Custer District, Custer County

The Helen group of claims is made up of the Helen lode and the Helen Nos. 1 to 5 inclusive. All of the claims are about 4 miles south of Custer, S. Dak., in the E1/2 sec. 10 and the W1/2 sec. 11, T. 4 S., R. 4 E. The group is owned by the Consolidated Feldspar Corp., Trenton, N. J. None of the claims is patented.

All of the claims contain dikes or segregations of pegmatite, and are primarily feldspar prospects. Most of the dike material on all of the claims is feldspar, with quartz, mica, and tourmaline. In some of the dikes the feldspar and quartz are intermixed.

Development on each claim is by a small opencut. The largest of these openings, on the Helen No. 4 claim, is about 100 feet long. Most of the other cuts range from 8 to 30 feet in length. On the Helen No. 5 a small shaft is the only opening.

No production has been reported from any of the claims.

Ref: 30, pp. 72-73.

D-90, Punch Mine (Wyoming Lode), Mica,
Custer District, Custer County

The Punch mica mine, formerly known as the Wyoming lode, is in the NW1/4 sec. 27, T. 4 S., R. 4 E. about 5-1/2 miles southwest of Custer, S. Dak. Present owners of the property are Francis Michaud and W. W. Wright of Custer.

Mica has been mined from the deposit since early in the century, but little is known of the early history.

The deposit is an irregular dike about 1,100 feet long and as much as 180 feet wide. It contains, in addition to mica, considerable feldspar, quartz, and tourmaline. Most of the mica is rum or ruby mica and is flat and hard. Some air staining is present, and part of the mica shows "A" structure. Sheet mica larger than 4 inches by 3 inches is rare.

Development is by several small surface cuts and a shallow shaft. The shaft is about 45 feet deep.

During 1943-44 the Punch mine produced about 1,200 pounds of trimmed sheet mica; most of this was No. 2 inferior mica.

Ref: 37, p. 83; 62, p. 396; 63, p. 302.

D-91, Cat Lode, Feldspar, Beryl,
Custer District, Custer County

The Cat lode is in the SW1/4 sec. 28, T. 4 S., R. 5 E. about 10 miles southeast of Custer, S. Dak. The property, an unpatented claim, is owned by W. F. Denean of Irwin, Tenn. It lies just east of the Bet lode also owned by Denean.

The deposit is a pegmatite dike in quartzite and schist. Most of the dike material is feldspar of good quality. Accessory minerals include quartz, mica, and tourmaline. A small amount of beryl also is present.

Development is by a single small opencut. This cut is 6 feet wide, 15 feet long, and 15 feet deep at the face.

The only recorded production from the property is 200 pounds of beryl.

Ref: 30, p. 65.

D-92, Bet Lode, Feldspar, Beryl,
Custer District, Custer County

The Bet lode, owned by W. F. Denean of Irwin, Tenn., is in the SE1/4 sec. 29, T. 4 S., R. 5 E. about 10 miles southeast of Custer, S. Dak. The property consists of a single unpatented claim and lies just west of the Cat lode also owned by Denean.

The deposit is a pegmatite dike in quartzite. It contains feldspar, quartz, mica, tourmaline, and a small amount of beryl. Some of the feldspar is intergrown with quartz.

Development is by an opencut about 6 feet wide, 5 feet deep, and 30 feet long. Material broken in the cut was sorted and the feldspar trammed to a bin 50 feet from the mouth of the cut.

About 30 tons of feldspar had been shipped in 1938. A small amount of beryl, probably 30 pounds, also was sorted and sold locally.

Ref: 30, p. 65.

D-93, H. & M. Lode No. 5, Feldspar,
Custer District, Custer County

The H. & M. lode No. 5, also known as the Howard mine, is in the SE1/4 sec. 29, T. 4 S., R. 5 E. about 9-1/2 miles southeast of Custer, S. Dak. The property, a single unpatented claim, is owned by E. E. Howard, P. E. Martin, and C. J. Young of Custer.

The deposit is a dikelike pegmatite in schist. It contains blocky feldspar with intermixed quartz, mica, and tourmaline.

Development in 1938 was by a small opencut about 10 feet wide, 25 feet long, and 15 feet deep at the face. Two men were engaged at that time in driving the cut. Feldspar was sorted after each blast and trammed 40 feet to a loading chute.

Total production is not known but undoubtedly is small.

Ref: 30, p. 61.

D-94, Harball's Mine, Feldspar,
Custer District, Custer County

Harball's mine is in the NW1/4 sec. 33, T. 4 S., R. 5 E. about 10-1/2 miles southeast of Custer, S. Dak. The property consists of two unpatented lode claims, the Happy No. 1 and the Happy No. 2, owned by C. W. McKay and Charles Harball of Custer.

The deposit is a series of steeply dipping, irregular pegmatites in schist and quartzite. Feldspar is the most abundant mineral in the pegmatites, together with quartz and considerable mica. A small amount of tourmaline also is present.

Development consists of a single opencut about 10 feet wide, 15 feet long, and 20 feet deep at the face.

No feldspar has been shipped from the deposit.

Ref: 30, p. 46.

D-95, Seal Mine, Mica,
Custer District, Custer County

The Seal mine is in the NE1/4 sec. 32, T. 4 S., R. 5 E. about 10 miles southeast of Custer, S. Dak. First located in June 1944 by W. A. Fay of Custer, the deposit was developed that year and in 1945 by Leon LaRue, also of Custer.

The deposit is a zoned pegmatite about 300 feet long and 95 feet wide. Four zones are present: A thin border zone, a fine- to medium-grained wall zone, a graphic granite intermediate zone, and a quartz pegmatite core. Mica, in books up to 12 inches in diameter, is found only in the wall zone. Other minerals in this zone include pink and white albite, quartz, and perthite.

Most of the mica is in free-splitting, hard books. These generally are strongly ruled and "ribbon" mica is common. Some of the mica is air stained.

Total production is not known. In 1944 sales of sheet mica were reported as 516 pounds. In 1945 about 72 pounds of sheet and 405 pounds of untrimmed punch mica were produced.

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D-96, Bull Elk Mine, Feldspar, Custer District, Custer County

The Bull Elk mine is in the N1/2 sec. 32, T. 4 S., R. 5 E. about 9 miles southeast of Custer, S. Dak. The property, an unpatented claim, was owned by the F. E. Schundler Feldspar Co. until 1943, when the Consolidated Feldspar Corp. took over the Schundler holdings.

The deposit is a dikelike pegmatite in schist. It strikes northwest for about 2,000 feet and dips steeply southwest. A lens or vein of good-quality feldspar has been exposed in the dike.

Little or no development work has been done in the deposit, and no production is reported from the property.

Ref: 30, p. 39.

D-97, Ann Mine, Mica, Custer District, Custer County

The Ann mica mine is in the SW1/4SW1/4 sec. 32, T. 4 S., R. 5 E. about 8 miles south of Custer, S. Dak. The claim extends into adjacent sections to the west and to the south. Mrs. Gladys Wells of Custer owns the property, which is an unpatented claim.

The deposit is an irregular pegmatite formed by the joining of two northwesterly trending dikes in quartzite and schist. One arm of the pegmatite is about 450 feet long and has a maximum width of 45 feet. The other branch, which is smaller, is about 130 feet long. Both dikes are poorly zoned, but, in general, wall zones of oligoclase and muscovite with appreciable quartz and microcline can be distinguished. The core of each dike is quartz and perthitic-microcline.

Development includes two opencuts and several hundred feet of underground workings. Almost all of the work has been done in the mica-bearing wall zones.

Production figures are not complete. Between October 1940 and October 1942, about 16,700 pounds of crude mica was produced from the surface cuts. In the period 1943-45, production included 307 pounds of large sheet mica, 2,440 pounds of small sheet mica, and 870 pounds of untrimmed punch. An additional 155 pounds of small sheet was recovered from the dump.

D-98, Art Lode, Feldspar, Pringle District, Custer County

The Art lode is in the NE1/4 sec. 6, T. 5 S., R. 5 E. about 3-1/2 miles northeast of Pringle, S. Dak. The property, an unpatented lode claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in schist. It contains feldspar partly intermixed with quartz, mica, and tourmaline. Most of the feldspar is iron stained, and nearly all of it contains quartz.

Development consists of a single small opencut about 5 feet wide, 15 feet long, and 8 feet deep at the face.

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No feldspar has been shipped from the property, which is idle today.

Ref: 30, p. 86.

D-99, McKay No. 1 Lode, Feldspar, Pringle District, Custer County

The McKay No. 1 lode is in the E1/2 sec. 4, T. 5 S., R. 5 E. about 12 miles southeast of Custer, S. Dak. The property, an unpatented lode claim, is owned by C. W. McKay and Charles Harball of Custer.

Little is known of the deposit, which is described as a pegmatite blow-up in quartzite. The pegmatite was being explored in 1938 to determine if the feldspar could be mined and shipped. No production has been reported.

Ref: 30, p. 46.

D-100, McKirahan Mica Prospect, Mica, Pringle District, Custer County

The McKirahan mica prospect is in the SW1/4SW1/4 sec. 6, T. 5 S., R. 6 E. about 8 miles northeast of Pringle, S. Dak. The property is a patented homestead and is owned by Orien McKirahan of Buffalo Gap, S. Dak.

The deposit is an irregular pegmatite in schist. It is composed of pink perthite, smoky quartz, albite, and muscovite, with a minor amount of biotite. Most of the dike material is stained with iron and has been softened by weathering.

Hard, ruby mica, in books up to 8 inches in diameter, makes up from 10 to 15 percent of the pegmatite. About 30 percent of the mica is clear; the rest is black stained.

A small cut, 15 feet wide, 20 feet long, and 18 feet deep at the face, is the only development work at the prospect.

About 3 tons of crude mica was produced in 1943; of this 87 pounds was sheet and 587 pounds was punch.

D-101, Ed Lode, Feldspar, Pringle District, Custer County

The Ed lode is in the SE1/4 sec. 4 and the NE1/4 sec. 9, T. 5 S., R. 5 E. about 4-1/2 miles northeast of Pringle, S. Dak. The property, an unpatented claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a dikelike pegmatite in schist and quartzite. It contains mixed feldspar, quartz, mica, and tourmaline.

Except for a single small opencut, the property is undeveloped. That cut is 12 feet wide, 10 feet long, and 8 feet deep at the face.

No production has been reported from the property.

Ref: 30, pp. 83-84.

D-102, Dakota Feldspar Mine, Feldspar, Mica, Beryl, Pringle District, Custer County

The Dakota Feldspar mine, known also as the Beryl Mica lode, is in the NW1/4 sec. 8, T. 5 S., R. 5 E. about 3 miles northeast of Pringle, S. Dak. The property consists of two unpatented claims and is owned by the Dakota Feldspar Co.

The deposit is a large pegmatite dike in quartzite. Most of the dike material is microcline. Accessory minerals include mica, quartz, tourmaline, and beryl.

Most of the mica, in a wall zone 8 feet thick, 100 feet long, and 50 feet deep, was mined about 35 years ago. This zone lies along the north wall of the pegmatite. Recent production has come from a mass of feldspar about 10 feet thick that formed the south wall of the old mica zone.

Development includes both surface and underground workings. Most of the mica was mined through a glory hole above a crosscut. The feldspar was mined in a large opencut. This cut, which follows the dike, is 17 feet wide, 200 feet long, and 40 feet deep.

Total production is not known. At least 34 tons of beryl has been shipped, as well as 10,000 tons of feldspar. Production figures for mica are not known.

Ref: 30, pp. 42-43; 50, p. 70.

D-103, Reed Mine, Feldspar, Pringle District, Custer County

The Reed mine is on the Sheppard ranch about 5 miles east of Pringle, S. Dak. The mine workings are about 1/2 mile north of the Smith mine, and probably are near the center of sec. 9, T. 5 S., R. 5 E. O. Reed has a lease on part of Sheppard's ranch.

The deposit is a ridgelike pegmatite, the center of which is good-quality feldspar. Associated with the feldspar is considerable quartz and mica. A small amount of tourmaline also is present.

Development in 1938 was by a single opencut on the west side of the ridge. This cut was about 10 feet wide, 50 feet long, and 20 feet deep at the face. A similar cut on the east side of the ridge was 15 feet wide, 30 feet long, and 20 feet deep at the face, but was being operated by the owner of the property, Mr. Sheppard.

Production from Reed's cut in 1938 averaged 5 tons of feldspar a day.

Ref: 30, pp. 40-41.

D-104, Smith Mine, Feldspar, Pringle District, Custer County

The Smith mine is on the Smith ranch about 5 miles by road east of Pringle, S. Dak. The mine workings probably are in the S1/2 sec. 9, T. 5 S., R. 5 E. near the south quarter corner of the section. The mine is leased to the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a steep-dipping pegmatite about 750 feet long that ranges in width from 30 feet to 80 feet. Near the center of the pegmatite is a lens of nearly pure feldspar; closer to the walls most of the feldspar is mixed with tourmaline. Quartz usually is present but is sorted easily. A small amount of beryl is found in parts of the pegmatite.

Four cuts were in active operation in 1938. One of these, known as the upper mine, had two 20-foot benches about 40 feet across. This cut was being followed along the strike by a second cut about 150 feet long and 40 feet deep. Two small cuts near the south end of the dike also were being mined.

Total production is not known, but the Smith mine is one of the largest feldspar mines in the area. At least 1,200 pounds of beryl was shipped in 1942 in addition to the feldspar.

Ref: 30, pp. 37-39.

D-105, Pigtail Prospect, Mica,
Pringle District, Custer County

The Pigtail prospect is in the SW1/4 sec. 14, T. 5 S., R. 5 E. about 5 miles east of Pringle, S. Dak. In 1943 the property was being operated by Leon LaRue of Custer.

The deposit is a small pegmatite lens about 60 feet long and 6 or 7 feet thick. It strikes northeast and dips about 40° northwest. The country rock is gray quartzite.

In general the pegmatite is distinctly zoned. A hanging wall zone of plagioclase, quartz, microcline, and tourmaline averages about 1 foot in thickness. All of the mica is found in this wall zone. The core of the dike is mostly quartz, with scattered crystals of pink perthite.

Development is by an opencut 20 feet wide, 40 feet long, and 20 feet deep at the face.

Production of sheet mica in 1943 totaled 75 pounds.

D-106, Ajax Claim, Mica,
Pringle District, Custer County

The Ajax claim is in the NE1/4 sec. 22, T. 5 S., R. 5 E. about 4-1/2 miles east of Pringle, S. Dak. The property is an unpatented lode claim owned by Frank L. Young, Hot Springs, S. Dak.

The deposit is a granitic pegmatite about 30 feet thick. Its length is unknown, and the composition of the pegmatite is uncertain.

Several small cuts along the pegmatite comprise the development. None of these cuts expose pegmatite containing sheet mica, but about 10 pounds of sheet, sold to the Colonial Mica Corp. in 1943, was reported to have come from the Ajax claim.

No further production has been reported.

D-107, Apex Claim, Mica,
Pringle District, Custer County

The Apex claim is in the NW1/4 sec. 22, T. 5 S., R. 5 E. about 4-1/2 miles east of Pringle, S. Dak. The property, an unpatented lode claim, is owned by Lou Pitts of Pringle.

The deposit is a branching pegmatite in schist and quartzite. Most of the pegmatite is coarse white to buff perthite and rose quartz. Masses of muscovite mica are associated with the perthite and quartz. Most of the mica is suitable only for scrap.

Development is by several opencuts and small pits. The main opencut is an L-shaped opening that follows the main pegmatite. This cut is about 150 feet long and 15 to 20 feet wide. A small pit southeast of the main opencut reportedly produced 1,000 pounds of beryl. A small amount of sheet and punch mica, probably less than 10 pounds, was sold from the property in 1943.

D-108, Bald No. 4 Lode, Feldspar,
Pringle District, Custer County

The Bald No. 4 lode is in the SW1/4 sec. 15, T. 5 S., R. 5 E. about 4-1/2 miles east of Pringle, S. Dak. The property, an unpatented lode claim, is owned by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a dikelike pegmatite in granite. It contains feldspar, quartz, pockets of mica, and a small amount of tourmaline. No information is available in regard to the exact size of the pegmatite.

Development is by a small opencut about 8 feet wide and 20 feet long. The cut is 8 feet deep at the face.

No production is reported from the property.

Ref: 30, p. 74.

D-109, Greene Mine, Feldspar, Beryl,
Pringle District, Custer County

The Greene mine, known also as the Red Monster and the Pink Monster, is in the SW1/4 sec. 9, T. 5 S., R. 5 E. about 2-1/2 miles east of Pringle, S. Dak. The mine originally was owned by L. C. Greene, who sold it in 1941 to the F. E. Schundler Feldspar Co. The Consolidated Feldspar Corp. acquired the property in 1942.

The deposit is a very large pegmatite that forms a long high ridge. The outcrop is about 1,000 feet long and from 100 to 150 feet wide. Most of the dike material is pink microcline. Subordinate minerals include quartz, muscovite, albite, and tourmaline. Beryl, in crystals as large as 6 feet in length, is found in parts of the pegmatite.

Development includes several opencuts and a 200-foot drift. The main cut is about 65 feet long, 45 feet wide, and 70 feet deep at the face. A second cut is 30 feet wide, 40 feet long, and 30 feet deep. A raise from the 200-foot drift opens in the floor of this cut. The third cut is about 600 feet northwest of the main pit.

Total production is not known. At least 12 or 15 tons of beryl has been shipped from the property.

D-110, Virginia Lode, Feldspar,
Pringle District, Custer County

The Virginia lode is in the NW1/4 sec. 18, T. 5 S., R. 5 E. about 1-1/2 miles northeast of Pringle, S. Dak. The property is owned by the Abingdon Sanitary Manufacturing Co., Abingdon, Ill.

The deposit is a large pegmatite in schist; it is at least 500 feet long and 250 feet wide at the center. The pegmatite is exposed as a cliff about 200 feet high. Most of the pegmatite is feldspar, with quartz, muscovite, tourmaline, and beryl.

Development is by three or four small opencuts. None of these has produced feldspar as the property is held in reserve by the Abingdon Sanitary Manufacturing Co.

Ref: 30, p. 71.

D-111, Bald No. 2 Lode, Feldspar,
Pringle District, Custer County

The Bald No. 2 lode is in the W1/2 sec. 17, T. 5 S., R. 5 E. about 2 miles east of Pringle, S. Dak. The property is an unpatented lode claim held by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in granite, schist, and quartzite. It contains feldspar, quartz, mica, and a small amount of tourmaline. Most of the feldspar is of good quality.

Development is by a shallow shaft 10 feet by 12 feet in section. This shaft is about 6 feet deep.

No production has been reported from the property.

Ref: 30, p. 74.

D-112, Hidden Treasure Lode, Feldspar,
Pringle District, Custer County

The Hidden Treasure lode is about 4 miles by road east of Pringle, S. Dak., in the NE1/4 sec. 17, T. 5 S., R. 5 E. The property is an unpatented lode claim owned by S. T. Gamber of Custer and leased to Fred Wheeler and W. W. Jolley.

The deposit is a pegmatite dike containing potash feldspar. Little is known of its size or composition.

Development consists of a single small opencut near the west end of the dike. This cut, 8 feet wide and 15 feet long, was 18 feet deep at the face. Feldspar, broken in the cut, was sorted and trammed 50 feet to a 10-ton loading bin. About 40 tons of clean feldspar was shipped in 1938. A small amount of exploration has been done at the east end of the dike, but no feldspar has been shipped except that noted.

Ref: 30, p. 55.

D-113, Bald No. 1 Lode, Feldspar, Pringle District, Custer County

The Bald No. 1 lode, about 4 miles by road east of Pringle, S. Dak., is in the NE1/4 sec. 17, T. 5 S., R. 5 E. The property is owned by the Consolidated Feldspar Corp., Trenton, N. J. It is unpatented.

The deposit is a dikelike pegmatite in granite and quartzite. It contains feldspar, quartz, mica, and tourmaline. Most of the feldspar is intergrown with quartz, and all of the minerals are mixed.

With the exception of desultory exploration at four places along the dike, the property is undeveloped.

Ref: 30, p. 74.

D-114, Bald No. 3 Lode, Feldspar, Pringle District, Custer County

The Bald No. 3 lode is in the SE1/4 sec. 17, T. 5 S., R. 5 E. about 3 miles east of Pringle, S. Dak. The property, an unpatented lode claim, is held by the Consolidated Feldspar Corp., Trenton, N. J.

The deposit is a pegmatite dike in granite, schist, and quartzite. It contains feldspar, which is intermixed with quartz, mica, and tourmaline.

Development consists of a shallow shaft and a small opencut. The shaft is 8 by 10 feet in section and 4 feet deep; the opencut is 6 feet wide, 5 feet long, and 8 feet deep at the face.

No production has been reported from the property.

Ref: 30, p. 74.

D-115, Ski-High Lode, Feldspar, Pringle District, Custer County

The Ski-High lode is in the W1/2 sec. 16, T. 5 S., R. 5 E. about 4-1/2 miles by road east of Pringle, S. Dak. The property consists of a single unpatented lode claim owned by S. T. Gamber and W. E. Burr, both of Custer, S. Dak. In 1938 the property was leased to Fred Wheeler and W. W. Jolley.

The deposit is a dikelike pegmatite. Little is known of the size. With the exception of a few holes drilled and blasted in the outcrop, there has been no exploration or development. These few holes disclosed blocky feldspar, quartz, and mica, with considerable tourmaline.

Ref: 30, p. 55.

D-116, Conlon Mine, Feldspar, Pringle District, Custer County

The Conlon mine, known also as the Anna-Marie mine, is in the NW1/4 sec. 20, T. 5 S., R. 5 E. about 2 miles east of Pringle, S. Dak. The property is part of a ranch owned by Joe Conlon of Pringle; the deposit is mined intermittently by regular ranch employees of Conlon.

The deposit is a poorly defined pegmatite in schist. A feldspar dike in the pegmatite contains feldspar, quartz, and a little mica. Most of the feldspar is of good quality and is readily sorted from the quartz. The feldspar contains little or no tourmaline.

Development is by an L-shaped opencut that was driven 25 feet through the schist to reach the dike. The cut then was turned to follow the feldspar. This cut is 10 feet wide, 15 feet long, and 12 feet deep at the face. Material broken in the cut was sorted and trammed about 75 feet to a 15-ton bin.

Total production is not known. About 115 tons of feldspar was shipped in 1938.

Ref: 30, pp. 46-47.

D-117, Wood Mine, Feldspar,
Pringle District, Custer County

The Wood mine is in the NW1/4 sec. 20, T. 5 S., R. 5 E. about 2 miles east of Pringle, and about 1/4 mile south of the Conlon mine. The property is owned by Annie Wood and Myrtle Conlon.

The deposit is a pegmatite dike in schist, quartzite, and granite. It contains feldspar of good quality.

Development consists of four opencuts. The main cut has been opened with two benches, each 20 feet high. The cut is about 15 feet wide. At the lower bench the cut is 50 feet long; the upper cut is about 40 feet long.

Material broken in the lower cut was trammed 75 feet to a 20-ton bin. At least 1,000 tons of feldspar has been shipped from the property.

Ref: 30, p. 47.

D-118, Townsite Lode, Feldspar,
Pringle District, Custer County

The Townsite lode is about 1 mile southeast of Pringle, S. Dak., in the NW1/4 sec. 19, T. 5 S., R. 5 E. The property is owned by the Abingdon Sanitary Manufacturing Co., Abingdon, Ill.

The deposit is an elongated pegmatite in schist. It strikes north and is 500 feet long and 40 feet wide. A large part of the pegmatite was overlain by sediments that had to be stripped before mining began. Most of the pegmatite is dark-blue or pink feldspar of excellent quality. Quartz, mica, and tourmaline are either absent or present only in small amounts.

Development is by an adit and raises to an open pit. Waste rock stripped from the pegmatite is disposed of above the pit.

Production figures are not available, but the property is operating steadily. All of the feldspar mined is shipped to the company plant in Illinois.

Ref: 30, p. 71.

D-119, Lone Pine Lode, Feldspar, Pringle District, Custer County

The Lone Pine lode is in the SE1/4 sec. 24, T. 5 S., R. 4 E. about 1/2 mile southeast of Pringle, S. Dak. The property is an unpatented claim and is owned by G. W. McCoy of Pringle.

The deposit is a dikelike pegmatite in quartzite. It contains blue and red feldspar, quartz, mica, and a small amount of tourmaline.

Development is by an opencut about 15 feet wide, 10 feet long, and 12 feet high at the face. This pit is reached through a cut about 3 feet wide and 25 feet long driven through wall rock of feldspar, mica, and quartzite.

In 1938 three men were working in the pit. Sorted feldspar was wheeled by hand about 40 feet to a loading platform. Production records are not available; the property is idle today.

Ref: 30, pp. 62-63.

D-120, Fanny McAdam Ranch, Feldspar, Pringle District, Custer County

The Fanny McAdam prospect is on the McAdam ranch about 7 miles southeast of Pringle, S. Dak. The prospect probably is in the S1/2 sec. 27, T. 5 S., R. 5 E.

Several parallel vertical pegmatites in granite and quartzite make up the deposit. These dikes strike north and are exposed through an area extending about 2 miles east and west. Some of the dikes are at least 1,000 feet long; the widest is about 75 feet at the outcrop. Dike material largely is pink or blue feldspar. Other pegmatite minerals generally are absent or present only in minor amounts.

No record of production is available; but it seems likely that little or no feldspar has been shipped.

Ref: 30, p. 58.

D-121, White Cloud Prospect, Mica, Beryl, Custer District, Custer County

The White Cloud prospect is in the NE1/4 sec. 15, T. 4 S., R. 4 E. about 4 miles southwest of Custer, S. Dak. The present ownership is not known.

The main White Cloud deposit is a dike about 200 feet long and 30 to 40 feet wide. It crops out above ground about 8 feet and dips about 25° SW. Two narrower dikes, one on each side, parallel the main dike. These dikes are 5 or 6 feet and 8 to 20 feet wide, respectively.

Development in the main dike includes a narrow cut into the dike through one of the walls and a pit 25 feet long, 12 feet wide, and 8 feet deep. This pit shows some good-quality feldspar, considerable granite, and coarse textured mixture of feldspar, quartz, and mica. Beryl, in crystals up to 1 inch in diameter, can be found in the dump material from the pit. A little mica also can be found, but most of it is suitable only for scrap mica.

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D-122, Red Bird Mine (McClaren Mine), Feldspar, Custer District, Custer County

The Red Bird mine, known also as the McClaren mine, is near the center of sec. 35, T. 4 S., R. 4 E. about 7-1/2 miles south of Custer, S. Dak. This property should not be confused with another Red Bird feldspar mine several miles northwest in sec. 15. That property is owned by the Consolidated Feldspar Corp.

The deposit is a dome-shaped mass of pegmatite about 185 feet long and 50 to 60 feet wide. It rises about 50 feet above the ground, and is composed largely of coarse pink microcline and quartz. Tourmaline, in unusually long crystals, is present near the top of the mass. Some mica also is present, but it is intergrown and shows "A" structure and most of it is ruled.

Development is by an open pit about 125 feet long, 30 feet wide, and about 75 feet deep. Entry to the pit is through an inclined shaft about 50 feet long that goes from the ground line to the floor of the pit at the northwest corner.

Total production is not known.

D-123, Blue Bird Lode, Feldspar, Beryl, Custer District, Custer County

The Blue Bird lode is in the SE1/4 sec. 35, T. 4 S., R. 4 E. about 8 miles south of Custer, S. Dak. The ownership is not known.

The deposit is a pegmatite dike about 300 feet long and 25 feet wide. It strikes north and dips steeply west. Most of the dike material is good-quality feldspar. Accessory minerals include quartz, beryl, tourmaline, and mica. Similar dikes are nearby; one is 40 feet west of the main dike and a second is 100 feet east.

Development in the main dike is by a long open pit along the west wall of the dike. This pit is about 8 feet wide, 100 feet long, and 15 feet deep.

Production records are not available. From the size of the dump, most of the material from the open pit apparently was high-grade feldspar, which was shipped.

D-124, Lucky Twist Mine, Feldspar, Mica, Beryl, Custer District, Custer County

The Lucky Twist mine is in the S1/2 sec. 25, T. 4 S., R. 4 E. about 7 miles south of Custer, S. Dak., and about 1 mile south of Beecher's Rock. The property is owned by Sutherland and Parker, Custer, and is known locally as the Sutherland mine.

The deposit is a pegmatite dike about 600 feet long and 70 feet wide. It strikes north and is almost vertical.

About one-third of the dike is feldspar, which is found in masses as large as 4 by 6 feet. Associated minerals include muscovite, quartz, beryl, and tourmaline. Most of the mica is in a 4-foot zone in the hanging wall; in general this mica is suitable only for scrap. Most of the beryl is in crystals less than 1 inch in diameter.

Development includes four small opencuts. These range in size from 12 feet long, 6 feet wide, and 3 feet deep to 30 feet long, 10 feet wide, and 6 feet deep.

Total production is not known. Incomplete figures indicate that during one 5-month period some 10 tons of scrap mica and 190 tons of feldspar were shipped from the deposit.

D-125, Aman Lode (Francis Lode), Feldspar, Mica, Pringle District, Custer County

The Aman lode, known also as the Francis lode, is in the S1/2 sec. 11, T. 5 S., R. 4 E. about 1 mile north-northwest of Pringle, S. Dak. The property is an unpatented lode claim owned by Roy Schull of Pringle.

The deposit is a sinuous dikelike pegmatite about 300 feet long and 10 to 12 feet wide. It strikes N. 25° W. and dips steeply northeast. Most of the dike material is gray feldspar and quartz. Muscovite mica, in small books, is present at places along the footwall of the pegmatite, and some mica was produced from early operations. An occasional beryl crystal also is seen, but these usually are too small to be of value.

Production is not known, but undoubtedly it is small.

D-126, La Rue Mine, Mica, Beryl, Pringle District, Custer County

The La Rue mine is in the SE1/4 sec. 22 and the NE1/4 sec. 27, T. 5 S., R. 5 E. about 5 miles east-southeast of Pringle, S. Dak. The present ownership is unknown.

The mine workings apparently are in a pegmatite spur that runs southwest from a large dike. The spur is about 200 feet long and 60 feet wide. It dips about 20° SW.

Most of the material in the pegmatite is feldspar and rose quartz. In general the feldspar is badly stained and of poor quality. Scrap mica is present in small pockets, and an occasional beryl crystal can be found in the dump. A small amount of columbite also is present in the dump, but none can be seen in the mine workings. Other accessory minerals include spodumene and tourmaline.

Development is by an open pit 45 feet long, 25 feet wide, and 8 feet deep. The pit is reached through a long narrow cut about 8 feet wide and 20 feet deep at the pit end.

No production figures are available.

D-127, Bull Head and Roosevelt Lodes, Mica, Beryl, Custer District, Custer County

The Bull Head lode and the adjoining Roosevelt lode are in the SW1/4 sec. 2, T. 4 S., R. 4 E. about 2-1/2 miles south of Custer, S. Dak. The property consists of two unpatented claims owned by Margaret Hampton of Custer.

The deposit on the Bull Head claim is a flat-topped oblong knob of pegmatite about 80 feet long and 70 feet wide. Most of the pegmatite is a mixture of mica, white feldspar, and quartz. An occasional small beryl crystal can be seen in some of the material.

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Several dikes are exposed on the Roosevelt claim, which is north of the Bull Head claim. These dikes consist of white feldspar, tourmaline, quartz, and mica. The dikes contain a small amount of beryl in crystals up to 1 inch across.

Development on the Bull Head lode is by 3 opencuts that range in size from about 10 feet square and 3 feet deep to a pit 50 feet long, 10 feet wide, and 6 feet deep. Two small cuts have been made on a pegmatite on the Roosevelt claim.

Both claims are only prospects. No production is reported, and the claims are of doubtful value.

D-128, Tom Carroll Claim, Feldspar, Beryl,
Custer District, Custer County

The Carroll claim is in the SE1/4 sec. 6, T. 4 S., R. 4 E. about 6 miles west of Custer, S. Dak. The claim, which is owned by Tom Carroll, is on the Kirk ranch.

The deposit is a large mass of granite and coarse pegmatite. The pegmatite is largely microcline, with quartz and mica. Beryl, in crystals up to 8 inches in diameter, is relatively abundant in parts of the deposit, particularly along the footwall.

A long narrow cut was driven along the center of the north side of the deposit to mine a lens of feldspar. Most of this work was done by Page Tubbs, who shipped a small amount of beryl as well as the feldspar.

Total production is not known; the property is idle today.

D-129, Volcano Lode (Eruption Lode), Mica, Amblygonite, Beryl,
Custer District, Custer County

The Volcano lode is along the west edge of sec. 6, T. 4 S., R. 4 E. just north of the southwest corner of the section. The property, which is known also as the Eruption lode, is an unpatented claim owned by T. J. Fenwick of Custer, S. Dak.

The deposit is a dikelike pegmatite in schist about 300 feet long and 30 feet wide. It strikes northwest and dips vertically.

The pegmatite contains quartz, feldspar, tourmaline, muscovite, beryl, amblygonite, and columbite-tantalite. Most of the tourmaline and mica are in zones along both walls of the dike; the beryl is scattered irregularly throughout the dike in small masses.

Three small cuts have been made in the pegmatite. Production in 1940-42 from these cuts (from approximately 136 tons of pegmatite) was 2 tons of beryl, 3 or 4 tons of mica, and 3 or 4 tons of amblygonite. The amount of feldspar was not recorded. These figures indicate that the pegmatite contains 1.5 percent beryl, from 2.2 to 2.9 percent mica, and from 2.2 to 2.9 percent amblygonite.

D-130, Victory Claim, Beryl, Mica,
Custer District, Custer County

The Victory claim is in the SW1/4 sec. 28, T. 4 S., R. 5 E. about 10 miles southeast of Custer, S. Dak. Present ownership of the property is unknown.

The deposit is wedge-shaped pegmatite about 200 feet long. It ranges in width from about 4 feet at the south end to about 100 feet at the north end. The pegmatite strikes north and appears to dip about 35° W.

Development includes five opencuts. Cut No. 1 is near the south end of the dike. This cut is 30 feet long, 20 feet wide, and 2 feet deep. Cut No. 2 is near the north end of the dike. This cut is 22 feet long, 10 to 30 feet wide, and 25 feet deep at the face. Part of the cut is in slate and part in granite. A small amount of poor quality mica remains on the walls. Cut 3 adjoins cut 2 on the west. This V-shaped cut is about 8 feet by 10 feet on the sides and 12 feet deep at the face. It shows a little poor-grade mica and stained feldspar. Cut 4 is on the east side of the pegmatite. No minerals of any value are exposed. Cut 5 is the largest opening in the deposit. It is about 35 feet long, 13 feet wide, and 10 feet deep. In the southeast corner of this cut is a second cut, about 16 feet long, 6 feet wide, and 5 feet deep. This is reached through a long narrow entry cut and shows considerable scrap mica, a little feldspar, and several large beryl crystals.

Production is not known.

D-131, Elk No. 1 Claim, Mica, Beryl,
Custer District, Custer County

The Elk No. 1 claim is in the NW1/4 sec. 9, T. 4 S., R. 5 E. about 4-1/2 miles southeast of Custer, S. Dak. The property, an unpatented claim, is owned by Reuben Mattox of Custer.

The deposit is a large flatiron-shaped mass of pegmatite about 1,200 feet long. On the large end the mass is 600 feet wide; it tapers to a point at the other end. Most of the mass is granite. Lenses and veinlike segregations of quartz and feldspar are found in the main mass. These lenses contain a small amount of mica and an occasional beryl crystal but for the most part they are quartz and feldspar with tourmaline.

Development is by several shallow cuts. One of these, known as the cut 1, is 22 feet long, 16 feet wide, and 8 feet deep. A small shallow cut adjoins this main cut at the south end.

No production has been reported from the deposit.

D-132, Black Hills Lime Co., Lime,
Pringle District, Custer County

The Black Hills Lime Co., plant and mine is in the W1/2 sec. 23, T. 5 S., R. 4 E. about 1 mile west-southwest of Pringle, S. Dak. The property, which consists of 620 acres of patented land and 160 acres of unpatented land, probably extends into sec. 22 on the west.

The deposit is a flat-lying bed of Pahasapa limestone. This has been opened by a stepped-face quarry. Limestone from this quarry is trammed by car to the plant, where it is crushed and burned in two 8-ton kilns. The capacity of the plant is 16 tons of lime an hour.

Total production is not known exactly. Between 1899 and 1935 the plant produced about 17,000 tons of finished lime. It has been a small but steady producer since 1935.

Ref: 37, p. 69.

D-133, Tanner Property, Beryl, Columbium-Tantalum, Mica, Pringle District, Custer County

The Tanner pegmatite is near the center of sec. 17, T. 5 S., R. 5 E. about 2 miles east of Pringle, S. Dak. The property is owned by John Tanner of Pringle and is leased to B. A. Gira and Carl Wiehe of Custer, S. Dak.

The deposit is a coarse-grained pegmatite about 120 feet long and 75 feet wide. Surface openings show the pegmatite to contain at least three zones. These include a wall zone of quartz, perthite, plagioclase, and muscovite; an intermediate zone of perthite, quartz, and plagioclase; and a core of quartz, cleavelandite, and spodumene. Beryl, columbite-tantalite, and tourmaline are accessory minerals. Most of the mica is suitable only for scrap, but a small amount of sheet and punch mica is present in the wall zone. The beryl and the columbite-tantalite are in or near the core, apparently associated with cleavelandite.

Development is by a T-shaped hillside cut about 12 feet wide, 30 feet long, and 20 to 35 feet deep. Production from this pit is not known, but some feldspar has been shipped from the property.

D-134, Corky Claim, Feldspar, Unorganized District, Custer County

The Corky feldspar claim is in the SE1/4 sec. 1, T. 4 S., R. 3 E. about 1/2 mile south of U. S. Highway 16 at a point 6 miles west of Custer. The claim is owned by Palmer Hibbard of Custer, who staked it in March 1937.

The deposit is a vertical dike several hundred feet long and 100 feet wide. It strikes N. 15° W. Development consists of one opencut 100 feet long, 15 feet wide, and 20 feet deep.

Feldspar is the only mineral of commercial value in the deposit, which contains minor amounts of scrap mica and triphylite-lithiophilite.

There has been little or no production from the deposit, and the property has been inactive since 1942.

D-135, Eruption Claim, Feldspar, Unorganized District, Custer County

The Eruption claim is in the SE1/4 sec. 1, T. 4 S., R. 3 E. about 6 miles west of Custer. It was located in 1938 by Tom Fenwich of Custer and is owned by Fenwich and the W. Fink estate of San Diego, Calif. The claim is about 1/2 mile south of U. S. Highway 16.

The deposit is a dike about 300 feet long and 50 to 75 feet wide. It strikes northwest and dips steeply southwest. Feldspar is the only mineral of commercial value present in the dike, but it contains minor amounts of scrap mica, triphylite-lithiophilite, and beryl.

Development consists of a cut 10 feet long, 6 feet wide, and 10 feet deep and a 20-foot shaft.

No production is recorded for the property, which has been inactive since 1943.

D-136, Michaud Prospect, Beryl, Mica, Unorganized District, Custer County

The Michaud claim, owned by the Custer Pegmatite Co., is in the E1/2 sec. 14, T. 4 S., R. 3 E. about 6-1/2 miles southwest of Custer.

The deposit is a coarse-textured pegmatite about 120 feet long and 10 to 14 feet wide. It strikes N. 35° W. and dips 75° NE. The pegmatite contains beryl, feldspar, mica, and tourmaline. Beryl is the principal mineral produced, but small amounts of feldspar and scrap mica have been shipped as well. Neither the feldspar nor the mica is of good grade. Most of the mica has a greenish cast and commonly shows rulings and "A" structure.

Development consists of two small pits. The North pit is 8 feet long, 10 feet wide, and 3 feet deep. The South pit is 8 feet long, 14 feet wide, and 10 feet deep. In 1942 considerable beryl was exposed in the north wall of the South pit; most of the material contained 20 percent beryl. Total production is not known. About 26 tons of beryl had been shipped by 1943, but additional production is listed for 1944. The mine is idle at present.

Ref: 36, pp. 202, 203; 37, p. 75; 61.

D-137, May Group, Gold, Unorganized District, Custer County

The May group is in or near the SE1/4 sec. 15, T. 4 S., R. 3 E. about 9 miles southwest of Custer. One of the early locations in the Black Hills, the group consists of 7 unpatented claims totaling 130 acres. The owners are: Francis Michaud, Custer; Palmer Hibbard, Pringle; Monte Heumphreus, Custer; Mary and Ford Heumphreus, Custer; and a Dr. Youngblood, Cincinnati, Ohio.

The deposit is a steep-dipping quartz stringer in slate and schist. A hornblende diorite dike usually is present on one of the walls.

According to Allsman the stringer is 4 inches wide at the surface. A pocket of very rich ore, with visible gold, was found in the early days, but intermittent prospecting since 1900 has not discovered additional ore rich enough to mine. Early reports indicate that the ore pocket mined was so rich that one man panned $80 worth of gold from decomposed surface material in 2 hours.

Development includes several shafts and a few short drifts. Two of the shafts are about 100 feet deep; another is 60 to 70 feet deep.

The most recent activity was between 1936 and 1938, when 3 or 4 men were at work deepening one of the shafts. The property is idle today.

Ref: 1, p. 132; 2, p. 193; 37, p. 75.

D-138, Red Spar Mine, Feldspar Beryl, Unorganized District, Custer County

The Red Spar mine is on Lightning Creek in the N1/2 sec. 23, T. 4 S., R. 3 E. about 7-1/2 miles southwest of Custer. The property is patented and is owned by the Consolidated Feldspar Corp.

The deposit consists of two pegmatite dikes that form the point of a ridge. One dike, on the west side, is 200 feet long and 12 to 25 feet wide. It strikes N. 15° E. and dips 20° to 30° E. The other dike, which is only 15 feet from the first at the south end of the deposit, is 80 feet long and 10 feet wide. It strikes N. 30° E. and hence diverges from the first dike.

Three cuts have been made in the larger dike. These cuts are about 20 feet long, 20 feet wide, and range from 5 feet to 10 feet in depth. The pegmatite in the cuts shows scattered small crystals of beryl, a feldspar zone, and abundant mica. The feldspar is of good grade, but the mica is green and shows "A" structure. In general, the pegmatite is fine textured.

According to Lincoln, the mine produced both feldspar and beryl in 1945. No production has been listed since that year.

Ref: 61.

D-139, Black Hills Porcelain Clay and Marble Co., Lithographic Stone, Unorganized District, Custer County

Extensive deposits of uniformly fine-grained limestone about 10 miles west of Custer were developed 50 years ago for lithographic stone. The principal deposit, in sec. 1, T. 4 S., R. 2 E., was opened by the Black Hills Porcelain Clay and Marble Co., Custer. Several shipments of excellent-quality stone were made from the upper bed of several fine-grained strata in the Pahasapa limestone. Most of the development was in a bed about 4 feet thick.

Lithographic stone is no longer in demand, and the quarries are idle today.

D-140, Argyle Fuller's Earth Deposit, Fuller's Earth, Unorganized District, Custer County

The Argyle Fuller's earth deposit is near the SE corner, sec. 12, T. 6 S., R. 3 E. about 3 miles west of Argyle and about 17 miles southwest of Custer.

Little is known of the present ownership. At least 1,000 acres in the area are underlain by the deposit, which is several feet thick.

The deposit was first developed about 1900, and several shipments were made. The material mined was not selected carefully, and sandy material from adjacent beds lowered the quality. Samples of good-quality material from the deposit gave excellent results with cottonseed oil. The material is a true Fuller's earth, as an average analysis shows:

	Percent
Silica	55.45
Alumina	18.58
Ferrous oxide	3.82
Lime	3.40
Magnesia	3.50
Loss on ignition	8.80
Volatile matter	5.35
	98.90

Ref: 17, p. 31; 45, pp. 107-108.

D-141, Case Group, Manganese, Unorganized District, Custer County

The Case group is in secs. 13, 14, 23 and 24, T. 6 S., R. 3 E. about 18 miles southwest of Custer. It lies on the east slope of Pleasant Valley at an altitude of 4,500 feet.

The group consists of six unpatented claims owned by G. H. Taylor, Dick Taylor, and John Warnke of Custer, S. Dak.; Lewis Collingwood of Pringle, S. Dak.; and Don Carrol of Omaha, Nebr.

The deposit is a flat-lying bed of altered sandstone containing manganese in the form of pyrolusite, which has replaced the original cementing material in the sandstone. Most of the ore is thin; it ranges from 18 inches to as much as 15 feet in thickness, and averages about 30 inches. Exact extent of the deposit is unknown, but an area as much as 1-1/2 miles long by 1/2 mile wide may be underlain by low-grade ore. From 5 feet to 35 feet of gravel overlie the deposit.

Development consists of a few small discovery cuts. Exact tonnage figures are not available, but a preliminary examination by Bureau of Mines engineers in 1941 indicated about 70,000 tons of ore that probably averages 10 percent manganese.

No production is recorded for the property. The ore, which is high in silica, would be difficult to concentrate by ordinary methods.

D-142, C & N Group, Manganese, Unorganized District, Custer County

The C & N group is in or near sec. 26, T. 6 S., R. 3 E. about 20 miles southwest of Custer. The group consists of two unpatented claims and is owned by Lewis Collingwood and L. B. Nichols of Pringle, S. Dak., and Don Carrol and William Molbey of Omaha, Nebr.

The deposit is an altered white sandstone loosely cemented with pyrolusite and minor amounts of hematite and limonite. The extent has not been determined, but the outcrop can be traced for about 500 feet. Manganese content ranges from 2 percent to 63 percent, but the average grade is probably not over 10 percent manganese. Both silica and phosphorus are high, and the ore would be difficult to concentrate to shipping grade.

No development work has been done, and, except for assessment, the property is unprospected. No production is recorded from the claims.

D-143, Jack Pot Group, Manganese, Unorganized District, Custer County

The Jack Pot Group, consisting of 2 unpatented claims, is in or near sec. 35, T. 6 S., R. 3 E. about 20 miles southwest of Custer. The claims are owned by Lewis Collingwood of Pringle, S. Dak., and John Warnke of Custer, S. Dak.

The deposit is one of several similar deposits of low-grade manganese in the area. In each, the manganese, in the form of pyrolusite, has loosely cemented conglomerate or altered sandstone. None of the deposits contain manganese of commercial grade.

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At the Jack Pot property only one exposure has been made in the ore. Here erosion has uncovered a 7-foot bed of sandstone conglomerate containing 14 percent to 15 percent manganese. Both phosphorus and silica are high, and the ore would be difficult to concentrate to an acceptable grade. No production has been made from the deposit.

D-144, Anthony Prospect, Bituminous Coal, Unorganized District, Fall River County

The Anthony prospect was in sec. 22, T. 7 S., R. 2 E. about 8 miles north of Edgemont in Fall River County. The prospect, opened by Fred Anthony in 1893, was one of several small openings driven to explore outcrops of coal in the area.

The principal prospect opening was an entry driven about 75 feet into the Lakota sandstone on the east bank of Coal Canyon. A second entry was driven to meet the main opening about 60 feet from the portal. These workings are caved today. According to Stone, who visited the area in 1911, about 33 inches of coal, bony coal, and carbonaceous shale was exposed in the main entry.

Other prospect openings nearby showed similar thin seams of coal and bony coal. At no place was a seam of pure coal thicker than 5 or 6 inches, and some of the drifts showed only carbonaceous shale. None of the prospects produced any coal, and the area today is abandoned.

Ref: 64, p. 45.

D-145,Cheyenne River Prospect, Bituminous Coal, Unorganized District, Fall River County

Several small prospect openings have been driven into outcrops of bituminous coal along the Cheyenne River east of Edgemont. None of these developed workable seams of coal, and the area is abandoned today.

The principal prospects were in secs. 4, 11, and 13, T. 9 S., R. 3 E. along the Cheyenne River. According to Stone, who visited the area in 1911, the coal generally is bony or composed of masses of carbonized fibers. Individual seams rarely were thicker than a few inches, and some of the openings showed only carbonaceous shale.

Ref: 64, p. 46.

D-146, Jim Hill Mine, Bituminous Coal, Unorganized District, Fall River County

The Jim Hill mine was in the NW1/4NE1/4 sec. 24, T. 9 S., R. 3 E. about 7 miles southeast of Edgemont. Like the other coal prospects in the region, the mine was opened in the bluffs along the Cheyenne River. According to Lincoln, the development consisted of 230 feet of inclined shafts and 180 feet of entries.

The coal bed is about 5 feet thick for some distance from the outcrop, but it thins rapidly and gives place to carbonaceous sandstone and coaly shale. Most of the coal produced was good quality light-weight bituminous coal. It contained thin layers of bony coal and a small amount of pyrite.

The mine has produced about 5,600 tons of coal during two periods of operation. Most of this, 5,000 tons, was produced in 1918-19; it sold for $18 a ton.

In 1934-35 the mine was again active. Some 600 tons was mined and sold for $3.50 a ton. The mine has been idle since 1935.

Ref: 37, p. 87.

D-147, Edgemont Quarry, Sandstone,
Unorganized District, Fall River County

The old Edgemont sandstone quarry is in sec. 17, T. 8 S., R. 3 E. about 3-1/2 miles northeast of Edgemont. The stone, from an upper member of the Dakota formation, was used to construct several prominent buildings in Edgemont and Cascade Springs. When freshly quarried the stone is easily worked. The beds are massive and readily accessible. Demand for such material has been limited by the high cost of transportation. This, together with an increase in the use of concrete, has curtailed the market for building stone.

A large part of the sandstone is suitable for grindstones, and the quarry is best known for the several thousand of those that it produced. The stone has fine, uniform grain of such character as to be suitable even for sharpening razors. Modern grinding and sharpening wheels, manufactured to exact requirements, have made grindstones obsolete, and the quarry has long been inactive.

Ref: 12, p. 292; 18.

D-148, Hot Springs Gypsum Co., Gypsum,
Unorganized District, Fall River County

The Hot Springs Gypsum Co. plant and quarry was at Erskine in or near sec. 18, T. 7 S., R. 5 E. Erskine, about 3 miles west of Hot Springs, was a siding on the Chicago, Burlington, & Quincy Railroad. The plant was built in 1911, but was not a success, and the operation was abandoned. The plant has long since been dismantled.

Gypsum beds near Hot Springs are in the Spearfish formation. Relatively pure, the beds are thick and easily worked. Lack of adequate markets has handicapped the gypsum plants near Hot Springs, as it has in other areas near the Black Hills. There seems little likelihood that the industry can be revived.

Ref: 15; 20; 37, p. 87.

D-149, Grant Robinson Mine, Gypsum,
Unorganized District, Fall River County

The Grant Robinson mine, formerly Baker Plaster Co., Hot Springs Plaster Co., and U. S. Gypsum Co., is in sec. 11, T. 7 S., R. 5 E. about 1 mile north of Hot Springs. The property consists of about 30 acres of patented ground.

Production began in 1893, when a two-kettle plant was erected north of Hot Springs. Output was about 30 tons a day, and consisted of Harwall plaster, finish plaster, and dental plaster. This plaster, of excellent quality, was shipped as far as Portland, Oreg., and Seattle, Wash. The plant burned in 1909 and was not rebuilt.

The deposit is a thick, pure bed of gypsum in the Spearfish formation. A section, measured by the Federal Geological Survey, shows a 15-foot bed of gypsum overlying a 14-foot bed of gypsum and separated from it by 10 feet of red shale, 4-1/2 feet of gypsum, and 1 foot of red clay. The gypsum was quarried in benches; the shale and clay were stripped off and disposed of as waste.

The mine has been idle since 1909.

Ref: 2, p. 117; 15, p. 6; 37, p. 86.

D-150, Evans Quarry, Sandstone, Unorganized District, Fall River County

The Evans quarry is in sec. 33, T. 7 S., R. 6 E. about 5 miles southeast of Hot Springs.

The quarry was opened on a large outcrop of Dakota sandstone about 60 years ago and operated continuously for more than 50 years. Total production is unknown but is undoubtedly large. Sandstone from the quarry was used to build the State Soldiers Home, the National Sanatarium, and the Evans Hotel, all in Hot Springs; the new Post Office in Custer; and the Public Library in Sioux City, Iowa. Dressed stone was shipped considerable distances; several buildings in the Northern Black Hills were built from Evans sandstone.

From 1930 to 1942 the quarry was owned and operated by the Hot Springs Stone Co. A dressing plant with gang saws, circular saws, and planers was constructed. When building stopped in 1942 because of the war, the operation closed down. The dressing plant was dismantled, and the quarry was abandoned.

The beds of sandstone at the quarry are massive and easy to dress when freshly exposed. Colors range from white or light gray to buff and pink, but the lighter colors predominate. The stone is uniformly fine-grained, and has a compressive strength of 8,000 pounds per square inch.

Ref: 15, p. 6; 37, p. 86; 61.

D-151, Odel Canyon Quarry, Sandstone, Unorganized District, Fall River County

The Odel Canyon quarry was in Odel Canyon in sec. 9, T. 7 S., R. 6 E. about 3 miles northeast of Hot Springs. Operations were begun about 1895 or 1896 and continued for only a few years.

The stone quarried was the Unkpapa sandstone, a massive, easy-to-dress stone. Rather soft, the stone was not as satisfactory as Dakota sandstone from nearby quarries, and for that reason the quarry did not have a long life.

Ref: 15, p. 6.

D-152, Burke Quarry, Sandstone, Unorganized District, Fall River County

The Burke quarry is in sec. 15, T. 7 S., R. 6 E. about 5 miles east of Hot Springs and about 3 miles north of the Evans quarry, which operated in recent years under the same management. (See D-150).

Stone quarried at the Burke quarry was the Dakota sandstone, a uniformly fine-grained, light-colored sandstone much in demand even 50 years ago.

Prominent buildings constructed from Burke stone include the Omaha Public Library, the Fort Dodge (Iowa) Library, and the First National Bank building in Lead. The railroad stations in both Deadwood and Lead were built with this stone, as were the Franklin Hotel in Deadwood, and buildings in Sheridan, Wyo., and Omaha and Lincoln, Nebr.

The deposit ranges from 30 to 50 feet in thickness throughout most of the 280 acres owned by the Burke Stone Co. Capacity of the plant, which included saws and planers, was about 300 tons of cut stone a day. Total production is not known, but it was large. The quarry is abandoned today.

Ref: 2, pp. 117-118; 15, p. 6; 37, p. 86; 61.

D-153, Elm Creek Quarry, Sandstone,
Unorganized District, Fall River County

The Elm Creek quarry was in sec. 2, T. 7 S., R. 6 E. almost on the boundary line between Fall River and Custer counties. Opened about 1895 or 1896, the quarry produced a small amount of stone for construction in Hot Springs and nearby towns.

The stone quarried was the Unkpapa sandstone. This sandstone is massive and easy to dress but is rather soft. For that reason it was not as satisfactory as Dakota sandstone from nearby quarries, and the operation was abandoned after a few years.

Ref: 15, p. 6.

D-154, Marietta Gravel Deposit (Tubbs Gravel Pit), Sand, Gravel,
Unorganized District, Fall River County

The Marietta gravel pit, operated by G. W. Tubbs of Edgemont, is on the Cheyenne River in sec. 6, T. 8 S., R. 2 E. about 8 miles northwest of Edgemont. Production began about 1909 and has been continuous since that time.

The deposits are sand bars parallel to the main stream of the Cheyenne River. They range in thickness from 2 feet to 6 feet; a single bar will yield from 500 tons to several thousand tons. The upstream edge of a bar generally is coarse heavy sand with pebbles and a few boulders. Downstream the bars grade into silty sand.

Most of the sand produced in early years was sold to the Chicago, Burlington, & Quincy Railroad for engine sand. At least 15,000 tons a year was used for this purpose. Total production between 1909 and 1919 (when Tubbs acquired the deposits) was 150,000 tons. From 1919 to 1929 the yearly production averaged 120,000 tons. Later figures are not available, but as the deposits are replenished after each flood, at least 50,000 or 60,000 tons a year are available.

Ref: 12.

BIBLIOGRAPHY

1. ALLSMAN, P. T. Reconnaissance of Gold Mining Districts in the Black Hills, South Dakota. Bureau of Mines Bull. 427, 1940, 146 pp.

2. BALDWIN, G. P. Black Hills Illustrated. Black Hills Mining Men's Assoc., 1904.

3. BLACK HILLS INDUSTRIAL REVIEW. A monthly journal published from January 1911 to March 1912.

4. BLACK HILLS MINING REVIEW. A weekly journal published at Deadwood from Jan. 14, 1895, to Apr. 26, 1907.

5. BLAKE, W. P. Columbite in the Black Hills of Dakota. Am. Jour. Sci., 3d ser., vol. 28, 1884, pp. 340-341.

6. BUREAU OF MINES. Southern Black Hills Mica. War Minerals Rept. 324, 1944, 11 pp.

7. CAMERON, E. N., and others. Internal Structure of Granitic Pegmatites. Econ. Geol. Mon. 2, 1949, 115 pp.

8. CARPENTER, F. R. Upon the Mineral Resources of the Black Hills, Their Character, Occurrence, and Extent. South Dakota School of Mines Bull. 1, 1888.

9. _____. Ore Deposits of the Black Hills of Dakota. Am. Inst. Min. Eng. Trans., vol. 17, 1889, p. 587.

10. CLARK, A. J. Milling, Amalgamation, Cyaniding. Eng. and Min. Jour., vol. 132, No. 7, 1931, pp. 298-304.

11. CONNOLLY, J. P. The Tertiary Mineralization of the Northern Black Hills. South Dakota School of Mines Bull. 15, 1927, 130 pp.

12. CONNOLLY, J. P., and O'HARRA, C. C. The Mineral Wealth of the Black Hills. South Dakota School of Mines Bull. 16, 1929, 418 pp.

13. CUMMINGS, J. B. Tin Deposits of South Dakota. Report of South Dakota State Planning Board, 1936.

14. _____. Tungsten Mining in South Dakota. Report of South Dakota State Planning Board, 1936.

15. DARTON, N. H. Oelrichs, South Dakota-Nebraska Folio (No. 85). Geol. Survey Geologic Atlas, 1902.

16. DARTON, N. H., and O' HARRA, C. C. Belle Fourche Folio (No. 164). Geol. Survey Geologic Atlas, 1909.

17. DARTON, N. H., and PAIGE, SIDNEY. Central Black Hills Folio (No. 219). Geol. Survey Geologic Atlas, 1925.

18. DARTON, N. H., and SMITH, W. S. T. Edgemont, South Dakota-Nebraska Folio (No. 108). Geol. Survey Geologic Atlas, 1904.

19. DUNCAN, G. S. Contribution to the Study of the pre-Cambrian Rocks of the Harney Peak District of South Dakota. Am. Inst. Min. Eng. Trans., vol. 43, 1913, pp. 207-208.

20. EHLE, C. G. Unpublished thesis. South Dakota School of Mines, 1911.

21. ENGINEERING AND MINING JOURNAL. Dakota Tin Mines and Their Enemies. Vol. 46, 1888, p. 212.

22. _____. Regional News, South Dakota. Vol. 146, No. 2, 1945, p. 163.

23. FISHER, J. D. Preliminary Report on Some Pegmatites of the Custer District. South Dakota Geol. Survey Rept. of Investigations 44, 1942, 35 pp.

24. _____. Preliminary Report on Mineralogy of Some Pegmatites Near Custer. South Dakota Geol. Survey Rept. of Investigations 50, 1945, 92 pp.

25. GARDNER, E. D. Tin Deposits of the Black Hills, S. Dak. Bureau of Mines Inf. Circ. 7069, 1939, 78 pp.

26. GRIES, J. P. Sampling of Helen Beryl Pegmatite, Custer County, S. Dak. Bureau of Mines Rept. of Investigations 4396, 1949, 14 pp.

27. _____. Investigation of the Beecher No. 2 Lithium-Bearing Pegmatite, Custer County, S. Dak. Bureau of Mines Rept. of Investigations 4632, 1950, 14 pp.

28. GROUT, F. F., and SCHWARTZ, G. M. Econ. Geology, vol. 22, 1936, pp. 369-373.

29. GUITERAS, J. R. Mining and Milling Methods and Costs at the Black Hills Tin Co., Tinton, S. Dak. Bureau of Mines Inf. Circ. 7084, 1939, 16 pp.

30. _____. Mining of Feldspar and Associated Minerals in the Southern Black Hills of South Dakota. Bureau of Mines Inf. Circ. 7112, 1940, 104 pp.

31. GWYNNE, C. S. Pegmatites in the Beecher Rock Basin. South Dakota Geol. Survey Rept. of Investigations 48, 1944, 23 pp.

32. HESS, F. L. Tin, Tungsten, and Tantalum Deposits of South Dakota. Geol. Survey Bull. 380, 1909, pp. 131-163.

33. HESS, F. L., and BRYAN, BARNABAS, JR. The Pegmatites at Tinton, S. Dak. Bureau of Mines Rept. of Investigations 3404, 1938, 19 pp.

34. IRVING, J. D., and others. Economic Resources of the Northern Black Hills. Geol. Survey Prof. Paper 26, 1902, 222 pp.

35. LANDES, K. K. Sequence of Mineralization in the Keystone, South Dakota Pegmatites. Am. Mineral., vol. 13, 1928, pp. 525-527.

36. LINCOLN, F. C. Beryl in the Black Hills. Eng. and Min. Jour., vol. 135, 1934, pp. 202-203.

37. LINCOLN, F. C., and others. The Mining Industry of South Dakota. South Dakota School of Mines Bull. 17, 1937, 199 pp.

38. McLAUGHLIN, D. H. The Homestake Enterprise, Ore Genesis, and Structure. Eng. and Min. Jour., vol. 132, No. 7, 1931, pp. 324-329.

39. NEEDHAM, A. B. Investigation of Mica Deposits at the Victory, Jack Rabbit, Rainbow, and Midas Mines, Custer County, S. Dak. Bureau of Mines Rept. of Investigations 4507, 1949, 26 pp.

40. _____. Investigation of Mica Deposits at the White Bear, Silver Dollar, Buster Dike, and Hot Shot Mines, Custer County, S. Dak. Bureau of Mines Rept. of Investigations 4693, 1950, 54 pp.

41. NOBLE, JAMES A. Ore Mineralization in the Homestake Gold Mine, Lead, S. Dak. Bull. Geol. Soc. Am., vol. 61, 1950, pp. 221-252.

42. NOBLE, JAMES A., and HARDER, JAMES O. Stratigraphy and Metamorphism in a Part of the Northern Black Hills and the Homestake Mine, Lead, S. Dak. Bull. Geol. Soc. Am., vol. 59, 1948, pp. 941-975.

43. NOBLE, JAMES A., and HARDER, JAMES O. and SLAUGHTER, A. L. Structure of the Part of the Northern Black Hills and the Homestake Mine, Lead, S. Dak. Bull. Geol. Soc. Am., vol. 60, 1949, pp. 321-352.

44. O'HARRA, B. M. Black Hills Gold-Bearing Iron-Quartz-Tremolite Belt. Eng. and Min. Jour., vol. 101, 1916, pp. 770-773.

45. O'HARRA, C. C. Mineral Wealth of the Black Hills. South Dakota Geol. and Nat. History Survey Bull. 3, 1902.

46. _____. The Mineral Wealth of the Black Hills. South Dakota School of Mines, Bull. 6, 1902.

47. _____. Bentonite, Its Occurrence, Properties, and Uses. Black Hills Engineer, vol. 17, No. 1, 1929.

48. PAIGE, SIDNEY. Geology of the Region Around Lead, S. Dak., and Its Bearing on the Homestake Ore Body. Geol. Survey Bull. 765, 1924, 58 pp.

49. REPORT OF SOUTH DAKOTA STATE PLANNING BOARD. Portland Cement, Gypsum, and Lime Industries in South Dakota. 1936.

50. ROSS, A. J. M. Ore Extraction and Transportation. Eng. and Min. Jour., vol. 132, No. 7, 1931, pp. 324-329.

51. ROTHROCK, E. P. A Geology of South Dakota. South Dakota Geol. and Nat. History Survey Bull. 15, part 3, 1944.

52. RUNNER, J. J., and HARMON, M. L. The Occurrence, Chemistry, Metallurgy and Uses of Tungsten, With Special Reference to the Black Hills of South Dakota. South Dakota School of Mines, Bull. 12, 1918, 264 pp.

53. SCHWARTZ, G. M. Geology of the Etta Spodumene Mine. Econ. Geol., vol. 20, 1925, pp. 646-659.

54. _____. Tin Mountain Spodumene Mine. Econ. Geol., vol. 25, 1930, pp. 275-284.

55. _____. Paragenesis of Iron Sulfides in a Black Hills Deposit. Econ. Geol., vol. 23, 1937, pp. 810-825.

56. SHARPE, J. W. The Old Mike and Its Products. Black Hills Eng., vol. 27, No. 3, 1942, pp. 207-210.

57. SIGMAN, VICTOR. Mining Operations at the Maitland Property in the Northern Black Hills. Black Hills Eng., vol. 23, No. 3, 1937, pp. 188-191.

58. SLAUGHTER, A. L. Mining Flat Formation Gold Deposits at the Bald Mountain Mining Co., Trojan, S. Dak. Black Hills Eng., vol. 23, No. 3, 1937, pp. 161-172.

59. SMITH, F. C. The Pottsdam Gold Ores of the Black Hills of South Dakota. Am. Inst. Min. Eng. Trans., vol. 27, pp. 404-428 (reprint by South Dakota School of Mines, pp. 1-24).

60. SMITH, W. C., and PAGE, L. R. Tin-Bearing Pegmatites of the Tinton District of Lawrence County, S. Dak. Geol. Survey Bull. 922-T, 1941, pp. 595-630.

61. STATE MINE INSPECTOR. Annual Reports. 1891 to 1926 and 1939 to 1948.

62. STERRETT, D. B. Mica Deposits of South Dakota. Geol. Survey Bull. 380, 1909, pp. 382-397.

63. _____. Mica Deposits of the United States. Geol. Survey Bull. 740, 1923, pp. 292-295.

64. STONE, R. W. Coal in the Black Hills. Wyo.-S. Dak. Geol. Survey Bull. 499, 1912, 66 pp.

65. THOMAS, CAPT. J. Harney Peak Tin Mines. Eng. and Min. Jour., vol. 54, 1892, pp. 512-514.

66. WING, M. E. Bentonites of the Belle Fourche District. South Dakota Geol. Survey Rept. of Investigations 35, 1940, 29 pp.

67. YATES, B. C. The Homestake Mine. Black Hills Eng., vol. 14, No. 3, 1926, pp. 131-143.

68. ZIEGLER, VICTOR. The Minerals of the Black Hills. South Dakota School of Mines Bull. 10, 1914, 250 pp.